EXHIBIT A

IN THE UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS TEXARKANA DIVISION

HITACHI MAXELL, LTD., *Plaintiff*, v. HUAWEI DEVICE USA, INC., and HUAWEI DEVICE CO., LTD., *Defendants*.	Civil Action No. 5:16-cv-00178-RWS LEAD CASE **JURY TRIAL DEMANDED**
HITACHI MAXELL, LTD., *Plaintiff*, v. ZTE CORP. and ZTE USA INC., *Defendants*.	Civil Action No. 5:16-cv-00179-RWS **JURY TRIAL DEMANDED**

EXPERT REPORT OF SCOTT ANDREWS REGARDING INVALIDITY OF U.S. PATENT NO. 6,748,317

Scott Andrews Report on the invalidity of US Patent 6,748,317

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Scott Andrews Report on the invalidity of US Patent 6,748,317

I. INTRODUCTION

1. I have been retained by counsel for ZTE Incorporated and ZTE USA Incorporated ("ZTE" or "Defendant"), and asked to review and provide my opinion on the patentability of claims 1-3, 6-8, 10, 15-17, and 20 ("the asserted claims") of U.S. Patent No. 6,748,317, which are being asserted by Plaintiff, Hitachi Maxell, Ltd.("Hitachi" or "Plaintiff" (EX1001, "'317 Patent")

2. I am being compensated at an hourly consulting rate for time actually spent reviewing materials and performing my analysis of the technical issues relevant to this matter. My compensation is not contingent on the outcome of this proceeding or the content of my opinions.

II. PROFESSIONAL BACKGROUND

3. I have over 30 years of professional experience in the fields of mobile and automotive technologies and systems, including vehicle information systems, and navigation systems. I have authored numerous published technical papers and am a named inventor on 11 U.S. and foreign patents.

4. I received a Bachelor of Science degree in Electrical Engineering from University of California, Irvine in 1977 and a Master of Science degree in Electronic Engineering from Stanford University in 1982.

5. From 1977 to 1979, I worked at Ford Aerospace where I designed, tested and delivered microwave radar receiver systems.

6. From 1979 to 1983, I worked at Teledyne Microwave, where I developed high reliability microwave components and developed CAD tools.

7. From 1983 to 1996, I worked at TRW, Inc., having held various positions. From 1983 to 1985, I was a Member of the technical staff and a Department Manager in the Space Electronics sector. Between 1985 and 1990 I was a project manager working on various communications systems projects including the US DoD Advanced Research Projects Administration (ARPA) MIMIC Program. Between 1990 and 1993 I was the Manager of MMIC (monolithic-microwave-integrated-circuit) Products Organization. In this role, I developed business strategy and managed customer and R&D programs. During this time, I also developed the first single chip 94 GHz Radar, used for automotive cruise control and anti-collision systems. In 1993, I transferred to the TRW Automotive Electronics Group, and managed about 30 engineers in the Systems Engineering and Advanced Product Development organization. In this role, I managed advanced development programs such as automotive radar, adaptive cruise control, occupant sensing, automatic crash notification systems, in-vehicle information systems, and other emerging transportation products.

8. During this time, I also worked with various types of accelerometers. For example, I developed a system that sampled the acceleration signal over time, and applied this time series of samples as inputs to a neural network. We then adjusted

the weights of the neural network so that the system would correctly discriminate between crash events and the events, for airbag activation. We also used accelerometers to determine and control airbag deployment parameters and timing, and to provide information about the crash severity to first responders.

9. I was employed as a Project General Manager in the Electronics Division of Toyota Motor Corporation at Toyota headquarters in Toyota City, Japan from April 1996 to around April 2000. In this position, I was responsible for leading the development of vehicle telematics systems, infotainment systems, including on-board and off-board navigation systems, traffic information systems, vehicle communications systems, safety applications, and automated vehicle control systems.

10. I am currently a consultant for Cogenia Partners, LLC, focusing on systems engineering, business development and technical strategy supporting automotive and information technology. I have been in this position since 2001. In one of my active engagements, I serve as the technical lead on a project funded by the National Highway Traffic Safety Administration (NHTSA) to develop requirements for connected vehicle safety systems in preparation for NHTSA regulations governing such systems. I also serve as a technical consultant on multiple projects sponsored by the Federal Highway Administration (FHWA) related to connected vehicle technology research.

11. In the various positions mentioned above, I was responsible for research and development projects relating to numerous vehicle information systems, user interface systems, sensory systems, control systems and safety systems, and also had the opportunity to collaborate with numerous researchers and suppliers to the auto industry. I therefore believe that I have a detailed understanding of the state of the art during the relevant period, as well as a sound basis for opining how persons of skill in the art at that time would understand the technical issues in this case.

12. A more complete summary of my experience, expertise, and publications is set forth in my curriculum vitae (Appendix A).

III. MATERIALS CONSIDERED

13. In the course of my investigation and in the preparation of this report I examined numerous documents. The documents most relevant to this work are listed below.

Exhibit	Reference
B	U.S. Patent No 6,748,317
C	U.S. Patent No. 5,781,150 ("Norris")
D	U.S. Patent No. 5,173,709 ("Lauro")
E	U.S. Patent No. 5,592,382 ("Colley")
F	Japanese Publication No. H10-232992 ("Nojima")
G	U.S. Patent No. 5,552,989 ("Bertrand")
H	US. Patent No. 6,125,326 ("Ohmura")
I	U.S. Patent No. 6,266,614 ("Almbaugh")
J	U.S. Patent No. 5,543,789 ("Behr")
K	Japanese Patent Publication No. JP08-202982
L	U.S. Patent No. 5,627,547
M	U.S. Patent No. 5,923,294

N	U.S. Patent No. 6,414,630
O	TravTek Global Evaluation and Executive Summary (Publication No. FHWA-RD-96-031 March 1996), (“TravTek1”)
P	TravTek System Architecture Evaluation (Publication No. FHWA-RD-94-141 July 1995), (“TravTek2”)
Q	TravTek Evaluation Orlando Test Network Study (Publication No. FHWA-RD-95-162 January 1996), (“TravTek3”)
R	McGraw Hill Electronics Dictionary, 6th Edition
S	Vehicle Location and Navigation systems by Ylin Zhao
T	P.R. 4-5(d) Joint Claim Construction Chart
U	The Court’s Preliminary Claim Constructions
V	Hitachi Maxell’s P.R. 4-2 Disclosure
W	ZTE’s 4-2 Disclosure
X	Hitachi Maxell's P.R. 3-1 and 3-2 Disclosures & Appendix 2
Y	ZTE's USA Inc.'s Provisional Preliminary Invalidity Contentions
Z	ZTE USA's Supplemental Invalidity Contentions
AA	U.S. Patent No 6,748,317 File History

IV. SUMMARY OF MY OPINIONS

14. In my opinion, the asserted claims of the ‘317 Patent are invalid. My opinions are based on my expertise in the technology of the ’317 Patent at the time of the alleged invention, as well as my review of the ’317 Patent, its file history, and the prior art discussed in this report. If Hitachi is allowed to submit additional evidence pertaining to the validity of the ’317 Patent, I intend to review that as well and update my analysis and conclusions as appropriate and allowed under the rules of this proceeding.

V. LEGAL PRINCIPLES

A. Claim Construction

15. My opinions are limited to what I believe a person of ordinary skill in the art would have understood the meaning of certain claim terms to be based on the patent documents. I use the principles below, however, as a guide in formulating my opinions.

16. I understand that it is a basic principle of patent law that assessing the validity of a patent claim involves a two-step analysis. In the first step, the claim language must be properly construed to determine its scope and meaning. In the second step, the claim as properly construed, must be compared to the alleged prior art to determine whether the claim is valid.

17. I understand that the words of a patent claim have their plain and ordinary meaning for a person skilled in the art at the time of the invention. This meaning must be ascertained from a reading of the patent documents, paying special attention to the language of the claims, the written specifications, and the prosecution history. I understand that an inventor may attribute special meanings to some terms by defining those terms or by otherwise incorporating such meanings in these documents.

B. Prior Art

18. It is my understanding that only information which satisfies one of the categories of prior art set forth in 35 U.S.C. § 102 may be used in any invalidity analysis under §§ 102 or 103. Therefore, if information is not properly classified as prior art under one of the subsections of § 102 of the Patent Code, then it may not be considered in an anticipation or obviousness determination. It is also my understanding that, for *inter partes* review, applicable prior art is limited to patents and printed publications.

19. I understand that the claimed priority date for the '317 Patent is July 12, 1999, based on a Japanese application. It is my understanding that an issued U.S. patent for a U.S. patent can be a prior art reference if it can claim priority to an earlier application (e.g., provisional application, parent application) that was filed before the priority date of the patent to be invalidated, and if one or more claims of the reference patent are adequately supported by the earlier application. In other words, a reference patent is entitled to claim the benefit of the filing date of its earlier application if the disclosure of the application adequately provides written description of the subject matter of the claims in the reference patent.

C. Anticipation

20. I understand that to anticipate a patent claim under 35 U.S.C. § 102, a single asserted prior art reference must disclose each and every element of the claimed

invention, either explicitly or inherently, to a person of ordinary skill in the art. I understand that a disclosure of an asserted prior art reference can be "inherent" if the missing element is necessarily present or is the inevitable outcome of the process and/or thing that is explicitly described in the asserted prior art reference.

D. Obviousness

21. I understand that a patent claim is invalid under 35 U.S.C. § 103 if the differences between the claimed invention and the prior art would have been obvious, at the time the invention was made, to "a person having ordinary skill in the art" ("PHOSITA") to which the claimed invention pertains. I understand that in the *Graham v. John Deere* decision, the U.S. Supreme Court outlined three issues that must be resolved in the obviousness determination: (1) the level of ordinary skill in the pertinent art, (2) the scope and content of the prior art, (3) differences between the prior art and the claims at issue. "Objective" considerations, such as commercial success and praise of the alleged invention, may also be considered in the obviousness analysis.

22. I understand that a PHOSITA is a hypothetical person who is presumed to have known the relevant art at the time of the invention. Such a hypothetical person would have the capability of understanding the scientific and engineering principles applicable to the pertinent art of the claimed invention. Factors that may

be considered in determining the level of ordinary skill in the art include: (A) the type of problems encountered in the art; (B) prior art solutions to those problems; (C) rapidity with which innovations are made; (D) sophistication of the technology; and (E) educational level of active workers in the field.

23. I also understand that in the *KSR v. Teleflex* decision, the U.S. Supreme Court outlined a variety of factors to consider in determining whether a claimed combination of components is obvious. These factors are set forth below in this declaration:

i. Motivation to Combine

24. I understand that a claimed invention may be obvious if some teaching, suggestion. or motivation exists that would have led a PHOSITA to combine the invalidating references. I also understand that this suggestion or motivation may come from such sources such as explicit statements in the prior art, or from the knowledge of a PHOSITA. Alternatively, any need or problem known in the field at the time and addressed by the patent may provide a reason for combining elements of the prior art. I also understand that when there is a design need or market pressure, and there are a finite number of predictable solutions, a PHOSITA may be motivated to apply both his skill and common sense in trying to combine the known options in order to solve the problem.

25. Obviousness may also be shown by demonstrating that it would have been obvious to modify what is taught in a single piece of prior art to create the patented invention. Obviousness may be shown by showing that it would have been obvious to combine the teachings of more than one item of prior art. In determining whether a piece of prior art could have been combined with other prior art or with other information within the knowledge of a PHOSITA, I understand the following are examples of approaches and rationales that may be considered:

ii. KSR Factors

26. One or more of the following principles set out in *KSR* may support the obviousness analysis disclosed below, and would render the challenged claims of the '317 Patent obvious in view of the prior art.

KSR Factor No.	KSR Factor Description
1	The identified prior art includes an express or inherent suggestion to modify or combine the reference in a way that renders the claimed invention obvious.
2	The combination of familiar elements of the challenged claims is obvious because it does no more than yield predictable results.
3	The patents simply arrange old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious.
4	Because the subject matter of the patents is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one, rendering the combination obvious.

5	Because the technique of the patents has been used to improve one device, a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, and thus using the technique is obvious unless its actual application is beyond his or her skill.
6	I may consider the interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patents at issue.
7	Market demand has driven design trends to render the claimed invention of the patents obvious.
8	The subject matter of the patents extends to what is obvious, and is therefore invalid.
9	The claimed subject matter of the patents is an obvious solution to a problem that was known at the time of invention.
10	The familiar items of the claims of the patents have obvious uses beyond their primary purposes, and a person of ordinary skill will be able to fit the teachings of prior art references together like pieces of a puzzle to demonstrate that the challenged claims are obvious.
11	The need and problem known in the field at the time of invention of the patent, and addressed by the patent, provides a reason for combining known prior art elements in the manner claimed in the patent.
12	There was a design need and/or market pressure to solve the problem addressed by the patents. Because there was a finite number of identified, predictable solutions to the problem addressed in the patents, a person of ordinary skill would have had good reason to pursue the known options within his or her technical grasp. Such a pursuit would have led to the anticipated success, making it likely that the product was not of innovation but of ordinary skill and common sense. In that instance, the fact that a combination was obvious to try might show that it was obvious.

iii. Secondary Considerations

27. I understand that certain objective factors, sometimes known as "secondary considerations," (also known as "objective indicia of non-obviousness") may also be taken into account in determining whether a claimed invention would have been obvious. In most instances, these secondary considerations of non-obviousness are raised by the patentee. In that context, the patentee argues an invention would not have been obvious in view of these considerations, which include: (a) commercial success of a product due to the merits of the claimed invention; (b) a long-felt, but unsatisfied need for the invention; (c) failure of others to find the solution provided by the claimed invention; (d) deliberate copying of the invention by others; (e) unexpected results achieved by the invention; (f) praise of the invention by others skilled in the art; (g) lack of independent simultaneous invention within a comparatively short space of time; (h) teaching away from the invention in the prior art. I also understand that these objective indications are only relevant to obviousness if there is a connection, or nexus, between them and the invention covered by the patent claims.

28. I understand that certain "secondary considerations," such as independent invention by others within a comparatively short space of time, indicates obviousness.

29. I also understand that secondary considerations of non-obviousness are inadequate to overcome a strong showing on the primary considerations of

obviousness. For example, where the inventions represented no more than the predictable use of prior art elements according to their established functions, the secondary considerations are inadequate to establish non-obviousness.

30. I understand that it is Plaintiff's burden to raise issues of secondary considerations if the Plaintiff believes these considerations exist. I have considered whether any secondary considerations of nonobviousness exist, and in my opinion, I have not seen any evidence of secondary considerations that suggest the nonobviousness of any asserted claim. If a Plaintiff's expert opines that any evidence of secondary considerations of nonobviousness does exist, I may render opinions in response.

iv. Date of Invention

31. I understand that absent clear and convincing evidence of invention date prior to the filing date of a patent, the invention date of the patent is presumed to be its filing date. A prior invention requires a complete conception of the invention and a reduction to practice of that invention. The patentee has the burden of establishing by clear and convincing evidence a date of conception earlier than the filing date of the patent.

32. I understand that conception is the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention. Conception must be proved by corroborating evidence which shows that the inventor disclosed

to others his complete thought expressed in such clear terms as to enable those skilled in the art to make the claimed invention. The inventor must also show possession of every feature recited in the claims, and that every limitation was known to the inventor at the time of the alleged conception. Furthermore, the patentee must show that he or she has exercised reasonable diligence in later reducing the invention to practice, either actual or constructive. The filing of a patent application can serve as a constructive reduction to practice.

E. Effective Filing Dates and Prior Art Patents and Printed Publications

33. I am informed that'317 Patent claims priority to U.S. Patent Application Number No. 09/613,634, filed on Jul. 11, 2000 (now Pat. No. 6,430,498), which in turn claims priority to a Japanese application (11-197010) filed on July 12, 1999.

34. I rely upon the following references, all of which I understand are prior art to all claims of the '317 Patent:

- U.S. Patent No. 5,781,150 ("Norris")
- U.S. Patent No. 5,173,709 ("Lauro")
- U.S. Patent No. 5,592,382 ("Colley")
- Japanese Publication No. H10-232992 ("Nojima")
- U.S. Patent No. 5,552,989 ("Bertrand")
- US. Patent No. 6,125,326 ("Ohmura")
- U.S. Patent No. 6,266,614 ("Almbaugh")

- U.S. Patent No. 5,543,789 (“Behr”)

VI. THE ‘317 PATENT

A. Summary

35. The ‘317 Patent was filed on May 5, 2003 and issued June 8, 2004. The ‘317 Patent includes three independent claims (1, 6, and 10), all of which are being asserted. The ‘317 Patent also includes 17 dependent claims, 8 of which are being asserted.

36. The ‘317 Patent describes “a portable terminal provided with the function of

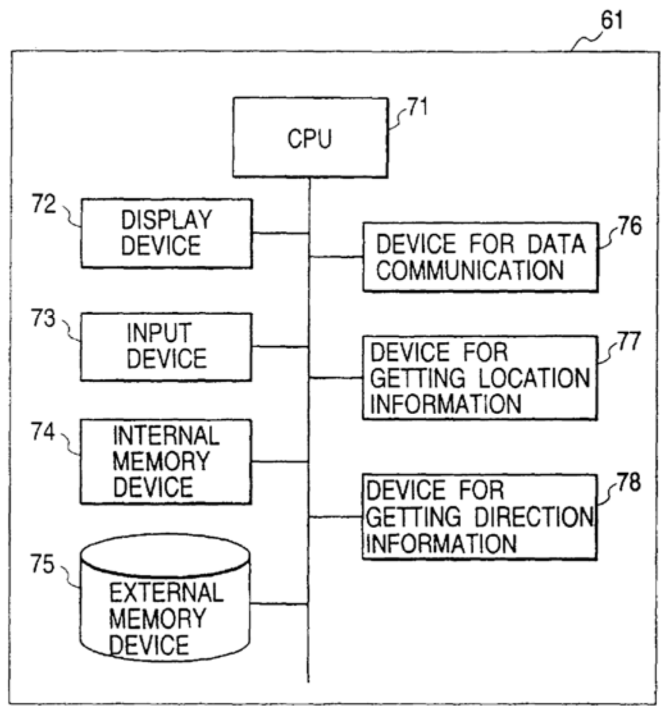
37. walking navigation, which can supply location-related information to the walking user’” (*See* ‘317 patent, col. 1, lines 16-18)

38. Because “the maps, when displayed on small-size screen of portable telephones and PHS terminals, are not displayed clearly” to a walking user, the ‘317 Patent provides a portable terminal that can “supply location information easier for the user to understand during walking with use of a narrow screen” and “realize a user-friendly interface that enables the walker (user) to understand inputs of retrieving conditions intuitively”. (*See* ‘317 patent col 1, lines 50-52, col. 2, lines 53-55, *and* col. 2, lines 59-61)

39. As illustrated in Figure 10, reproduced below, the portable terminal of the ‘317 patent includes a CPU or processor 71, a display device 72, an input device 73, an internal memory 74, an external memory 75, a communications device 76, a

device for obtaining the location or position of the portable terminal 77, and a device for obtaining the direction or orientation of the portable terminal.

FIG. 10



40. The '317 patent describes that the user may input a desired destination using the input device. For example:

> In step 103, an input by the walker 10 is controlled so that the walker 10 enters data to select a menu and/or set retrieving conditions on the setup screen interactively with use of such an input device as a button key, a pen, a microphone, etc. of the portable terminal.
>
> (*See* '317 patent, col. 5, lines 44-48)

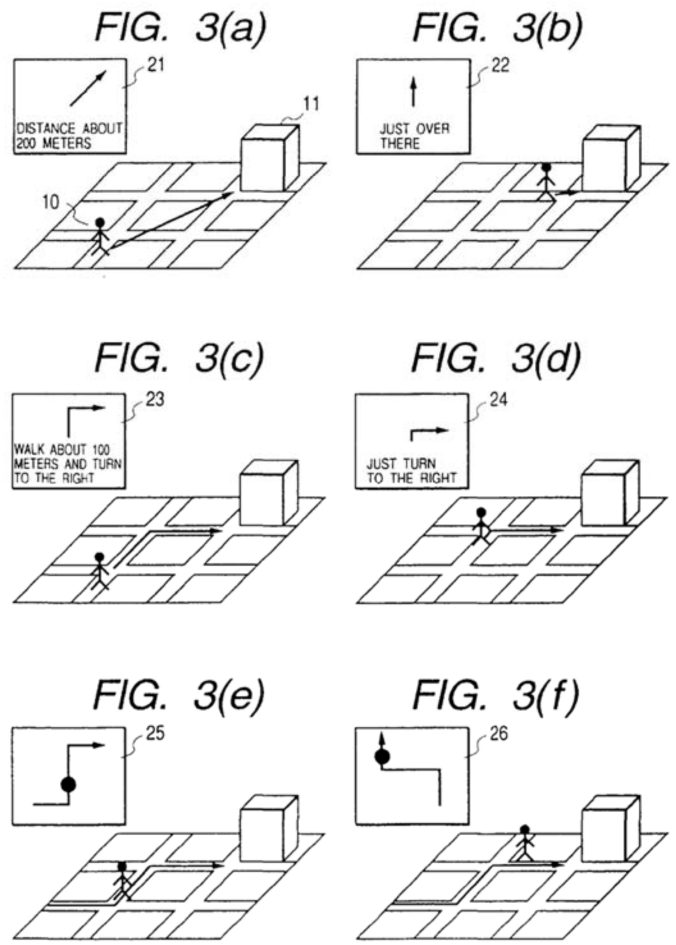
41. The portable device then obtains the current location of the device, and the direction of the device. Fr example:

> At first, the walker 10 gets the location information of the portable terminal with use of a device in step 106. The location information of the portable terminal here is represented by a latitude/longitude or coordinates and an altitude. For example, the location information is measured with use of a Cellular antenna and such an infrared ray sensor as a GSP, PHS, or the like. Then, the walker 10 gets the direction information of the portable terminal with use of a device in step 107. The direction information is the direction of the tip of the portable terminal or the orientation of the display screen represented by a direction and an angle of elevation. For example, a compass, a gyro, and such a sensor as a clinometer are used to measure the direction information.
>
> (*See* '317 patent, col. 5, line 60 to col. 6, line 6)

42. The portable terminal then retrieves the location of the destination, and displays a route from the current location to the destination. For example:

> If the route guidance service is selected in step 103, the system retrieves information of, for example, a route between the present place and the destination. In step 110, the system controls compression of the information, which is a result of retrieving in step 109 so as to compress the information according to the terminal information set in step 108 so that it is displayed on the small screen.
>
> (*See* '317 patent, col. 6, lines 13-19)

43. Examples of this displayed route are shown in Figures 3(a) through 3(f), reproduced below.



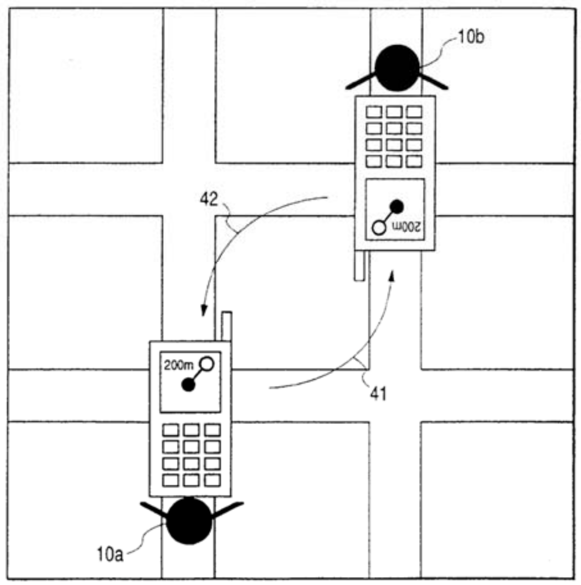
44. The ‘317 patent also describes determining the location of another terminal through data communications, and displaying the location of that terminal on the display. For example:

> This service is used when the user (walker), who is to meet someone by appointment, notifies his/her present place to the partner and confirm the partner's present place. In FIG. 10a and l0b denote walkers who will meet each other by appointment. Compressed information items 41 and 42 denote flows of data sending/receiving to confirm their present places. In this embodiment, data may be exchanged directly between portable terminals just like the message sending function of portable telephones and PHS terminals.

(*See* '317 patent, col. 8, lines 14-22)

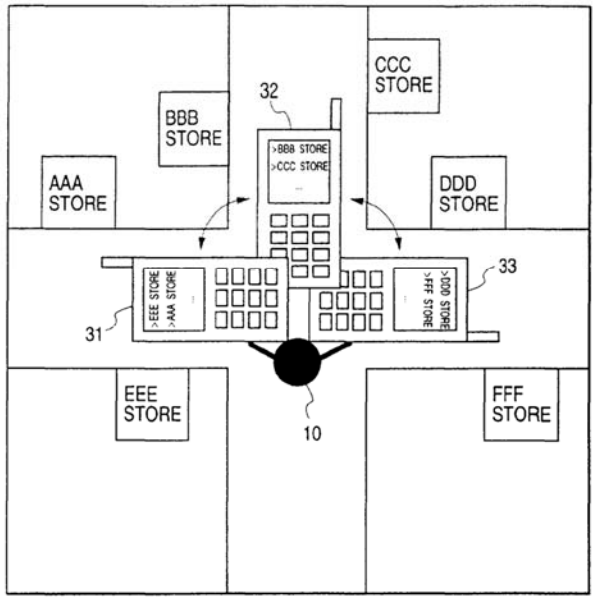
45. This display is shown in Figure 5, reproduced below.

FIG. 5



46. A purportedly novel feature of the system described in the '317 patent is that the display changes depending on the orientation of the device. For example, as shown in Figure 4, reproduced below, as the orientation of the device changes, the points of interest (in this case various stores) that lie in each direction change.

FIG. 4

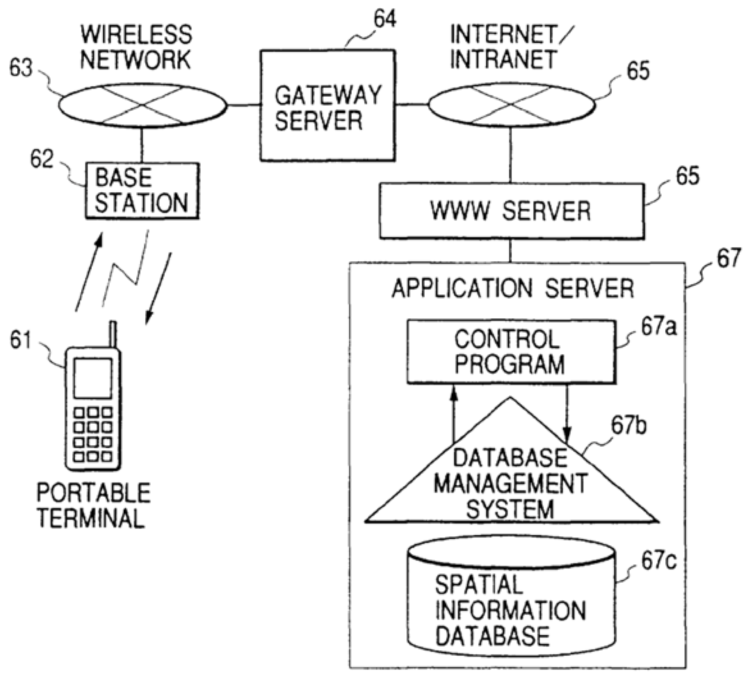


47. The '317 patent also describes obtaining information about the local area from a server. For example:

> To supply such services, the system is configured with a portable terminal of the present invention with the function of walking navigation respectively and a server that supplies necessary information on the Internet/intranet. Just like the Internet services available through portable telephones or PHS terminals, each portable terminal, wireless network, a gateway server, the Internet/intranet, and the application server are sequentially connected. The application server is provided with a spatial information database, a database management system, as well as a control program. The spatial information database stores maps information and such information contents as movies, entertainment and business events, restaurants, etc.
>
> (*See* '317 patent, col. 3, lines 44-56)

48. This is also illustrated in Figure 9 of the patent, reproduced below.

FIG. 9



B. The Asserted Claims

49. I have been informed that Hitachi has asserted claims 1, 2, 3, 6, 7, 8, 10, 15, 16, 17, and 20 of the '317 patent. These claims are provided for reference below.

> 1. A portable terminal, comprising: a device for getting location information denoting a resent place of said portable terminal; a device for getting a direction information denoting an orientation of said portable terminal; an input device for inputting a destination; and a display, wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation.

> 2. A portable terminal according to claim 1, wherein said

direction from said present place to said inputted destination is denoted with an orientation of line.

3. A portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number.

6. A portable terminal, comprising: a device for getting location information denoting a present place of said portable terminal; a device for getting direction information denoting an orientation of said portable terminal; a device connected to a server; and a display, wherein said device connected to said server outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server, and said display displays said retrieved information.

7. A portable terminal according to claim 6, wherein said information is stores or roads information.

8. A portable terminal according to claim 6, wherein said display displays said retrieved information as lists.

10. A portable terminal, comprising: a device for getting location information denoting a present place of said portable terminal; a device for getting direction information denoting an orientation of said portable terminal; a device for getting a location information of another portable terminal from said another terminal via connected network; and a display, wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation.

> 15. A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow.
>
> 16. A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route.
>
> 17. A portable terminal with walking navigation according to claim 15, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route.
>
> 20. A portable terminal with walking navigation according to claim 17, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route.

VII. SCOPE OF THE PRIOR ART

50. I have been informed by counsel that when determining whether a patent is obvious, the general scope and content of the prior art at the time is relevant. That is, a finding of obviousness is more likely if there is a wide variety of prior art that discloses functionalities and system architectures identical or similar to those of the challenged patent. Conversely, a finding of obviousness is less likely if there is a scarcity of prior art that discloses similar functionalities and architectures.

51. Here, as illustrated above, the body of prior art disclosing the major functionalities and structures of the ’317 Patent was expansive as of the invention

of the ’317 Patent. I believe that numerous other prior art references had also disclosed all of the major functionalities claimed by the ’317 Patent well before its priority date. While my analysis below is focused on the specific items of prior art discussed in the Petition, my knowledge of the broader prior art available to a PHOSITA as of the priority date of the ’317 Patent informs my judgments concerning obviousness.

VIII. OVERVIEW OF THE TECHNOLOGY

52. I have been asked to briefly summarize the background of the prior art from the standpoint of a PHOSITA, which person I have defined below, prior to the invention of the ’317 Patent.

53. The navigation/positional information systems described in the ’317 Patent were well known for many years prior to July 12, 1999.

54. Development in the field of electronic navigation systems began in earnest in the 1980s with the activation of the Global Positioning System (GPS). Even early navigation systems were able to provide positional and navigational information to the user.

55. One of the earliest production handheld GPS navigation devices was the Magellan NAV 1000. This device was introduced for public sale in 1988[1]. The unit, illustrated below, included a flip up GPS antenna, an LCD display, and a keypad for data input.

56. The NAV 100 operated generally from geographic coordinates, so the user would specify the latitude and longitude of their destination, and any way points, and the device would then determine its current position, and provide distance to

[1] *See, e.g.*, https://timeandnavigation.si.edu/multimedia-asset/magellan-nav-1000-gps-receiver-1988 (accessed 11/19/2017)

the destination, and any of the way points, as well as the current heading required to travel from the current position to the next way point. Since the display was entirely alphanumeric, this course heading was presented as a numerical value in degrees (i.e., as a compass heading).

57. While the ‘317 patent describes its invention as pertaining to providing navigational guidance to pedestrians (i.e., “walking navigation”), the basic functional elements used in the system do not differ substantively from early navigation systems used in air, marine, or vehicle navigation systems.

58. For example, in 1995 Delco Electronics produced and sold publicly the Telepath 100[2]. This was a small in-car unit that was intended to fit in the standard sized 1-DIN radio opening found in most cars of that era. Because of its small size the display was necessarily also rather small, and because of the low target price point the system did not provide a full moving map display, as was typical of full featured in-vehicle navigation systems of the time (mostly found in Japanese vehicles in the 1995 time frame). I attended a demonstration of the Telepath 100

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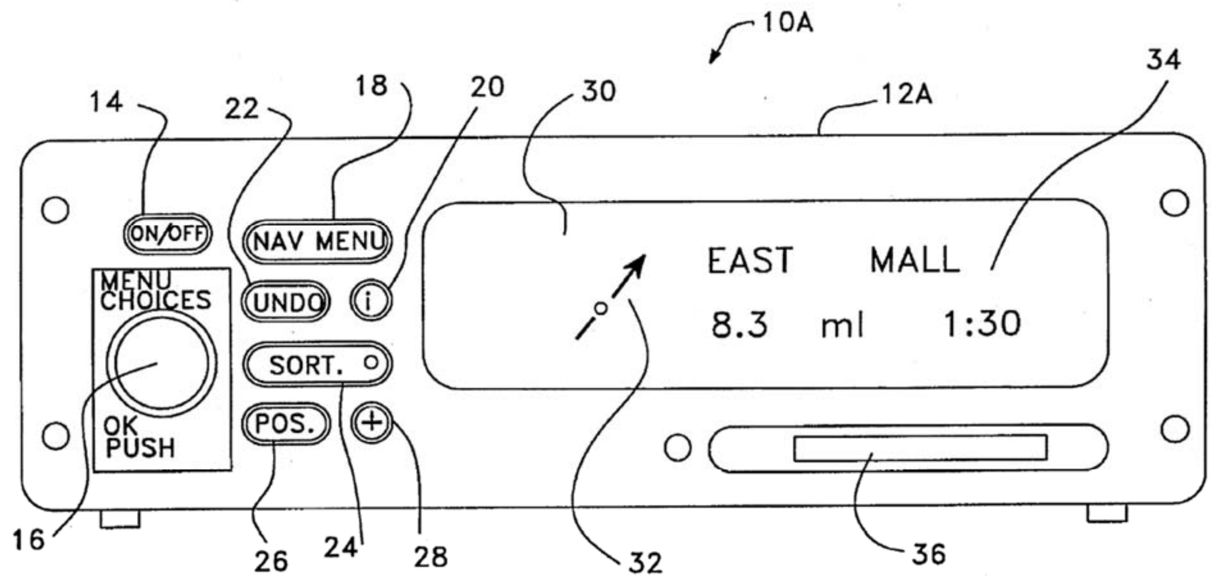
[2] See, e.g., New Systems Keep You Safe And On Track Chicago Tribune, January 22, 1995, By Jim Mateja. Accessed 11/19/2017 at http://articles.chicagotribune.com/1995-01-22/travel/9501220175_1_delco-electronics-aftermarket-system-radio-slot

system at an industry conference in about 1996. I also purchased a used unit which is presented in the photograph below.

(Photograph of Telepath 100 unit in my possession)

59. This unit used a map database resident on a PCMCIA memory card that the user would place in the slot below the screen. In operation, the system did not provide turn by turn driving instructions, nor did it display a map. Instead, it presented a graphical arrow that pointed in the direction of the destination, and also indicated the "as the crow flies" distance from the destination. This is the same basic functionality that was claimed by the '317 patent, four years later. This functionality can be seen diagrammatically in the figure below, reproduced from U.S. Patent No. 5,627,547, which is a Delco Electronics patent on this same product.



Fig–1

60. As can be appreciated in the figure, the destination is set to “East Mall”. The arrow points from the current position in the direction of this destination, and the distance from the current location to the destination is displayed. During the demonstration I attended, as the vehicle direction changed the arrow on the display would rotate so that it was always pointed at the destination, an upward arrow indicating that the destination as ahead, a right arrow indication the destination was to the right, and so forth.

61. One navigation system combining vehicle navigation and cellular communications was the TravTek system developed in the early 1990s[3]. TravTek was an Intelligent Transportation System developed as a result of a joint research project between the Federal Highway Administration, Florida Department of Transportation, the City of Orlando, the American Automobile Association, and General Motors. The project is summarized in numerous publications by the U.S. DOT. Three of these are: TravTek Global Evaluation and Executive Summary (Publication No. FHWA-RD-96-031 March 1996), ("TravTek1"), and TravTek System Architecture Evaluation (Publication No. FHWA-RD-94-141 July 1995), ("TravTek2"), and TravTek Evaluation Orlando Test Network Study (Publication No. FHWA-RD-95-162 January 1996), ("TravTek3").

62. Early systems such as the Magellan NAV 1000 did not provide map databases or displays. A key development around 1990 was the digital map database, and what is known as the "moving map display". One of the first demonstrations of these technologies was the TravTek program. An operational field test of TravTek was conducted with about 100rental car customers in Orlando, Florida for a one-year period between 1992 and 1993, and the program

[3] *See e.g.,* TravTek System Architecture Evaluation (Publication No. FHWA-RD-94-141 July 1995) Preface

gathered information on the performance of the system, and reactions from the general public. (TravTek2, page 1)

63. The TravTek in-vehicle system provided two route guidance visual displays including a Route Map display (TravTek 1, Figure 6 below) and a "maneuver-by-maneuver Guidance Display" using directional arrows to indicate the maneuvers the user was to take (TraveTek1, Figure 7 below):

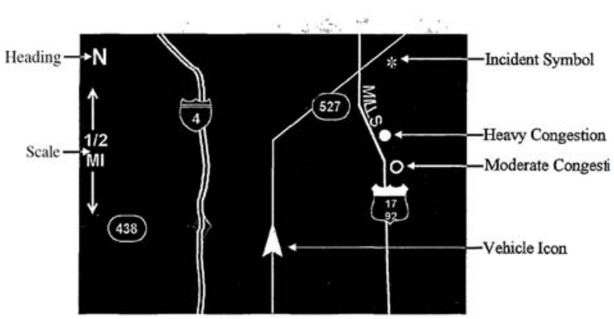


Figure 6. TravTek Navigation Plus display.

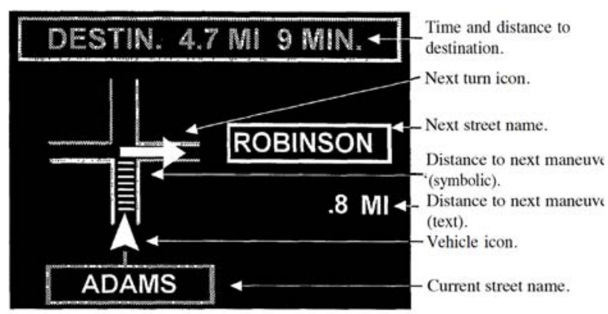


Figure 7. The TravTek Guidance Display.

64. The maneuver display (right photo) was fixed, in that it did not move as the vehicle moved, but rather would be displayed prior to the approach where the maneuver was to be made. The road map display would scroll across the screen as the vehicle moved. The system provided two map orientation modes: Heading up and North up. This is described in the report as:

> The navigation system used a combination of dead-reckoning, map-matching, and Global Positioning System information to indicate the vehicle's position on the map. The vehicle's position was indicated by a horizontally centered icon that was three fourths of the distance from the top of the screen. When the vehicle was in DRIVE the map was displayed in a heading-up

> format. Figure 6 provides an example of a navigation display with congestion and incident traffic information. Only the Navigation Plus configuration displayed traffic congestion and incident information. When the vehicle was in PARK, soft (touch sensitive) buttons on the display provided optional heading-up and north-up selections.
>
> (TravTek1, Page 18)

65. In the "north-up" mode, the map would scroll both vertically and horizontally to maintain the vehicle icon in the desired position on the screen (centered laterally and located on the lower quarter of the screen, see Page 18. The vehicle icon itself would then rotate relative to the screen as the car's orientation changed relative to the earth's coordinate grid (i.e., relative to north). In "heading-up" mode the map would scroll vertically, and rotate as the vehicle turned, so that the top of the map always represented the region ahead of the vehicle. The rotation of the vehicle icon in north-up mode, and the map image in heading-up mode was determined by outputs from a compass:

> Navigation Function - This function consisted of showing the vehicle position on a map displayed via the color CRT. The map data base was supplied by Etak, and the vehicle position was monitored by a flux gate compass, with distance sensing via wheel sensors, and a GPS receiver for position correction.
>
> (TravTek1, page 14)

66. Thus determining the orientation of a naviagtion terminal, and adjusting the map display accordingly was well-known by the time the application that became the ‘317 patent was filed.

67. Similarly, the TravTek system was able to generate a route from the current location to a selected destination. The figure below shows the presentation of a route indicated by a bent line (shaded and indicated in the photo) with indicating the specific route to take from the current location to the selected destination.

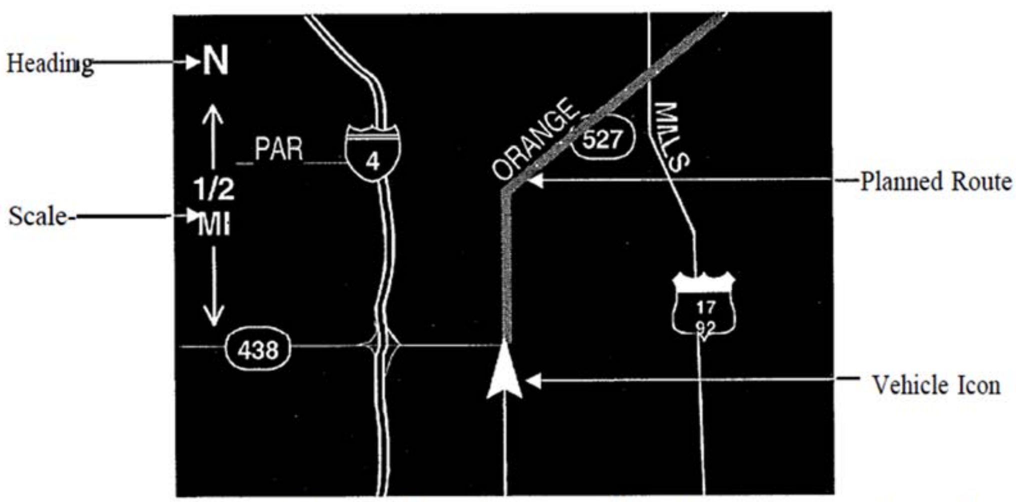
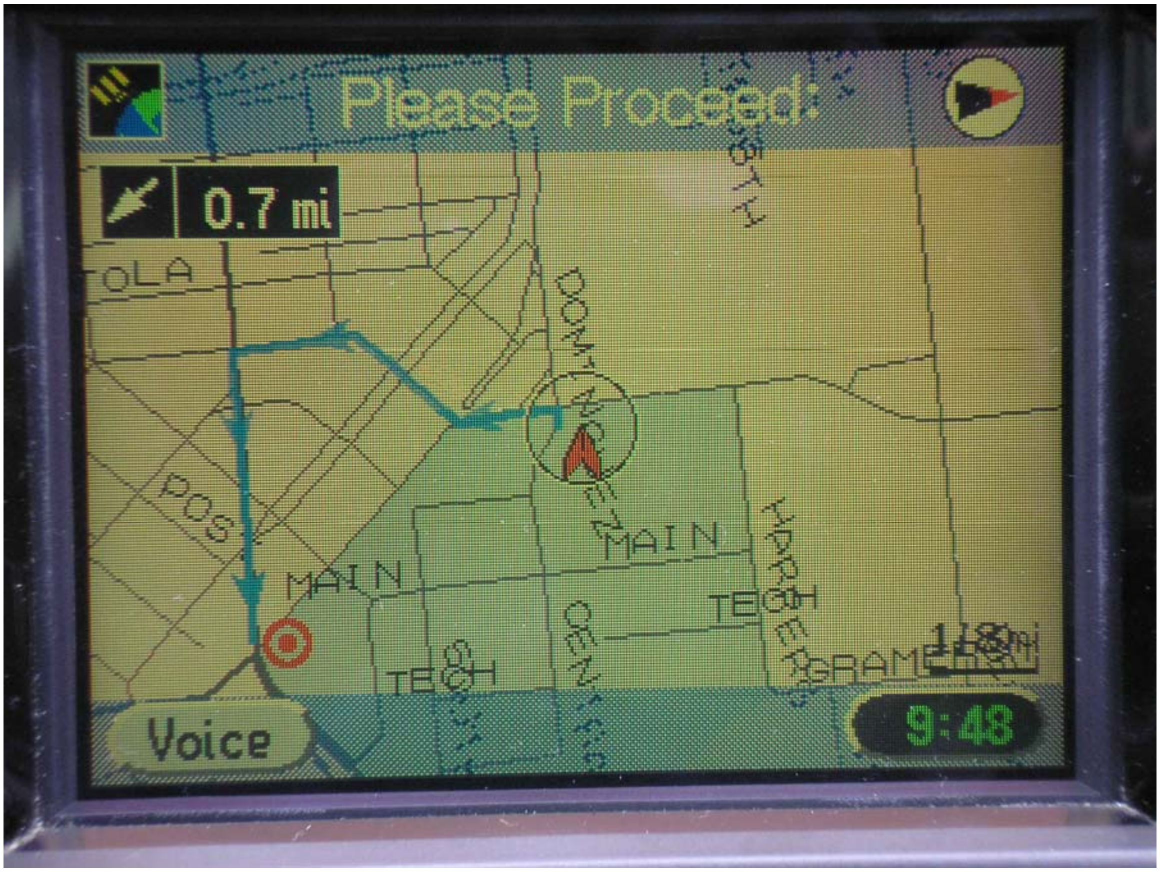


Figure 4. The TravTek Route Map displays the planned route as an overlay on the heading up map display.

(TravTek3, Figure 4)

68. This same display approach has been used by nearly every moving map navigation system. For example, the 1996 Acrua RL was one of the first production navigation systems sold in the United States. I personally photographed a 1996 Acura RL as part of American Calcar v. Honda Motor Co. Inc. (06cv2433-DMS (CAB)). The image below shows a map display with the starting point (red

arrowhead) and destination (red target) linked by a route that is indicated by a bent blue line with arrows to indicate the direction to go, and where to turn.



1996 Acura RL Navigation System Route Display

69. Thus a PHOSITA would also have been highly familiar with the concept of showing the route by using a highlighted line that was bent to follow the specific course of roads from the starting location to the destination.

70. The TravTek system also included cellular voice and data communications to provide navigational and traffic information from fixed servers to the vehicles. This is illustrated conceptually in TravTek2 Figure 2, reproduced below.

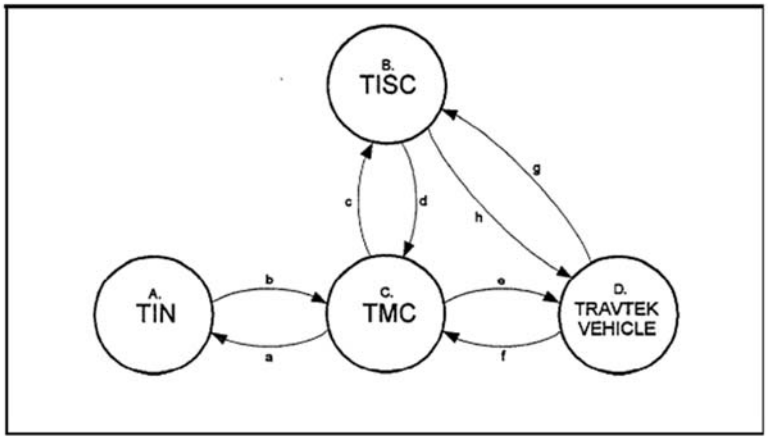


Figure 2. TravTek system diagram.

Four major system elements contributed to the TravTek system operation:

A. **Traffic Information Network** (TIN) - Network traffic data source and/or sink; online, usually manned.

B. **TravTek Information and Services Center** (TISC) - Local business services, events and help center; online, manned.

C. **Traffic Management Center** (TMC) - Traffic data collection and management, operations, and communications center; online, manned.

D. **TravTek Vehicle** - Onboard driver information platform with mobile communications; provided link travel time feedback.

71. The Traffic Information and Service Center (TISC) included a remote map database as well as a local information directory (TravTek2, page 11). This large set of databases included information on roads (74,000 navigable links), and stores (Yellow Pages listings). For example:

Data base management was a large effort of the TISC. The map data base was a detailed representation of the greater Orlando metropolitan network. Of the total 87,000+ links in the Orlando area data base, 74,000 were navigable links. Approximately 11,000 of these represented the arterial (major roads) road network. There were 17,700 unique street names and 46 municipalities (cities) within the area of coverage. Over 13,000 non-navigable links represented water boundaries, railroads, parks, and other topological boundaries that were necessary for a comprehensive map display. Other information associated with network link records in the data base consisted of data such as:

- Attributes separately defined for each side of the link.
  - zip code.
  - lowest address.
  - highest address.
  - city.
- Name.
  - Prefix, such as North, Southwest, etc.
  - Type, such as street or avenue.
  - Suffix, such as east, west, etc.
- Length in miles and km.
- Ramp sign text.
- Road or lane restriction information.
- Link type, such as freeway, local street, etc.
- Turns restriction.
- Position: latitude and longitude.
- Points of interest.
  - Name and address.
  - Phone number.
  - Hours of operation.
  - City code.

An equally large data base management effort was associated with the Local Information Directory Data Base. The local information directory included:

- Where to stay.
  - 250 Orlando area hotels and motels.
  - Site information: credit cards accepted, meal plans, etc.
- Where to eat.
  - 170 Orlando area restaurants.
  - Site information: cuisine type, price range, etc.
- Yellow page listings.
  - Central Florida Phone Book Yellow Pages selected listings.
  - 33 sub-categories.
  - Name, address, telephone number.
  - Only within TravTek map area of coverage.

TraTek2, pages 29-30

72. Thus, making navigation information, particularly information about roads and stores available to a mobile device via a server was well-known at east by 1993.

73. In addition, the presentation of this sort of information was typically provided in lists. The 1996 Acura RL navigation system referenced above included such lists. The images reproduced below show a list of tyes of restaurants available in the map database, and then, from the selection of "Italian", a listing of Italian restaurants sorted by distance from the current position.

1996 Acura RL Restaurant Types List

1996 Acura RL Italian Restaurant List

74. Thus, a PHOSITA would have also been familiar with the concept of providing point of interest information from a mapo database and presenting the available selections in the form of a list.

75. The integration of the cellular phone with navigation devices was not confined to automotive applications. For example U.S. Patent No. 5,923,294, by Bacelon, describes two small handheld GPS devices that can communicate thier position information to one another. The simple display then provides each user

with a diagram that indicates the of the other unit relative to their current position (which is the center of the display), and the heading and speed of the other unit (if it is moving). From this the user can determine the direction to the other unit, as well as how far away it is. The system and the display are illustrated in Figures 1 and 2 of the patent, reproduced below.

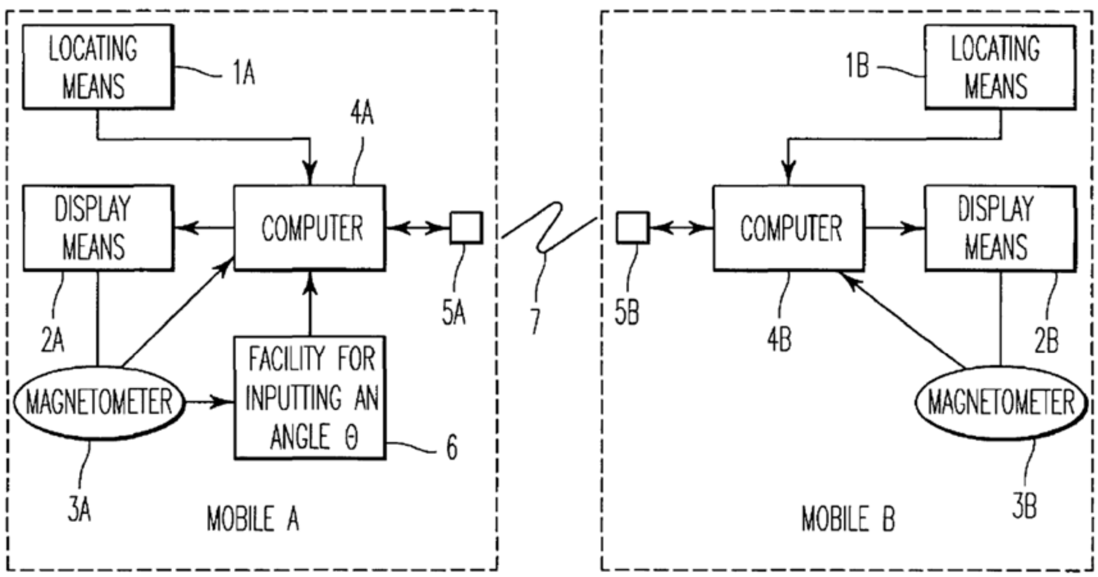


FIG. 1

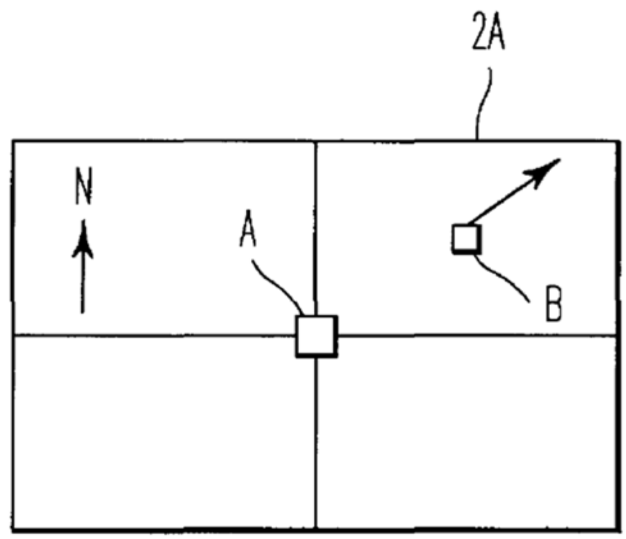


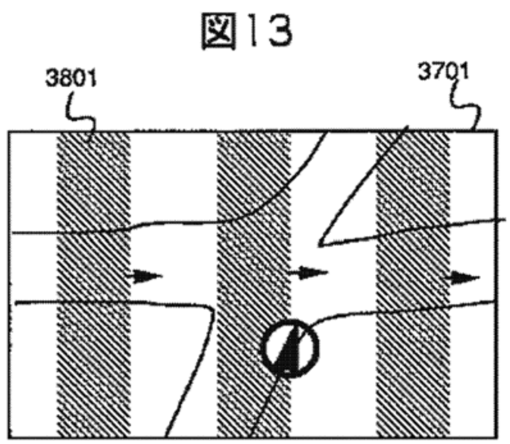
FIG. 2

76. A similar patent by Sony, U.S. Patent No. 6,414,630, describes a system using two GPS terminals that include a radio link so that they can exchange location information abou the "mobile object" that they are associated with. The patent describes this system in a variety of contexts, including the "users own position (S*ee, e.g.,* col. 2, lines 32-35) (i.e. pedestrian), as well as "automobiles, airplanes and ships" (S*ee, e.g.,* col. 1, lines 5-7).

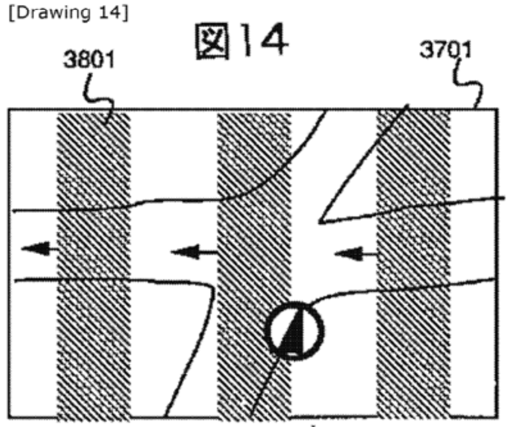
77. Early navigation systems were not limited only to vehicle based systems. For example, a Japanese patent application filed by Hitachi on Januray 24, 1995 (JP08-202982 to Takashi et al), describes a pedestrian navigation system.

78. The Takashi system used a GPS receiver and a compass to provide position and orientation information, and provided a meand for inputting a destination. The

system would then determine the best walking route, taking into consideration the risks associated with crossing streets and such. The Takahsi system provided guidance by displaying a map of the current area, with the current location indicated. Animated stripes were then superimposed on the display to indicate the direction in which the user was instructed to walk. Examples of this display are reproduced below.



[Drawing 14]



[Drawing 15]

Takhashi Figures 14, and 15).

79. Thus, a PHOSITA would have been highly familiar with the application of navigation systems to both vehicular navigation and pedestrian navigation, and

would have understood how to apply location finding, direction finding and display technology to provide a moving map guidance display to both vehicle users as well as pedestrian users.

As described in greater detail below, U.S. Patent No. 5,543,789 to Behr, describes a system that provides navigational information on a portable device. This device generates requests that are sent over a cellular phone link to a server. The server fulfills the request, for example by returning a route from the current location to a specified destination, or by returning information about nearby points of interest.

IX. CLAIM CONSTRUCTION

80. Below is my understanding of the claim terms of the ’317 Patent that have been agreed to by the parties and the terms that are still disputed. Because the Court has not yet issued its final claim construction ruling, I have analyzed the prior art under each of ZTE’s proposed construction, Plaintiff’s proposed constructions, and the Court’s tentative claim construction rulings. As I discuss below, it is my opinion that, assuming a claim is not held indefinite, it is anticipated or rendered obvious by the prior art under the parties’ and the Court’s tentative constructions, at least under the scope of the claims required by Maxell’s infringement contentions.

i. Agreed Constructions for the '317 Patent

Term	Construction
“an input device for inputting a	Plain and ordinary meaning

destination" ('317 Patent, Claim 1)	
"a device for getting a location information of another portable terminal from said another terminal via connected network" ('317 Patent, Claim 10)	Plain and ordinary meaning
"a device for retrieving a route from said present place to said destination" ('317 Patent, Claim 15)	Plain and ordinary meaning

ii. Disputed Constructions for the '317 Patent

a. "walking navigation" ('317 Patent claims 1, 10, 15, 16, 17, and 20)

ZTE's construction	**Plaintiff's construction**
"display of information to assist a user in walking, not driving, in a system that is not usable in an object car that is running on a road"	"information to navigate a user who is walking"
Court's tentative construction	
"information to navigate a user who is walking"	

b. "said device connected to said server outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server" ('317 Patent claim 6)

ZTE's construction	**Plaintiff's construction**
Indefinite This is a means-plus-function element to be construed in accordance with 35 U.S.C. § 112, ¶ 6. **Function**: outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server	Plain and ordinary meaning

Structure: insufficient corresponding structure is disclosed	
Court's tentative construction	
Function: outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server **Structure:** device for data communication 76 of a portable telephone and a Personal Handyphone System (PHS) terminal (Fig. 10, 9:47-49), or equivalents thereof	

81. For those limitations where the Court has not provided a construction, I have applied Plaintiff's interpretation of the plain and ordinary meaning, as to those limitations, as that meaning is understood by a person of ordinary skill in the art, to the extent Plaintiff's interpretations can be discerned from Plaintiff's Infringement Contentions in this case.

X. OPINION ON A PERSON OF ORDINARY SKILL IN THE ART

82. In my opinion, a person of ordinary skill in the art at that time of the filing of the application that became the '317 patent would have at least a bachelor's degree in computer engineering or electrical engineering (or equivalent degree/experience) with at least two years of experience in navigational and/or electronic display systems. I base this opinion on the level of technical training I believe is required to reduce to practice the concepts described in the '317 patent and the relevant prior art; on my own experience in hiring and supervising about 30 engineers engaged in development of these types of systems at that time; on my experience working with developers of these types of systems at Toyota Motor Corporation in

Japan, and on my experience working with a technical staff drawn from about 20 different auto maker and automotive electronics suppliers as part of the development of the AMI-C specifications.

XI. OVERVIEW OF THE PRIOR ART

A. U.S. Patent No. 5,781,150 ("Norris")

83. Norris issued on July 14, 1998 from an application filed October 13, 1995. I understand that Norris qualifies as prior art under at least 35 U.S.C. §§ 102(a) and (b).

84. Norris describes "A system of GPS devices which receive civilian GPS signals and provide an intuitive graphical interface for displaying the relative position of GPS devices in relation to each other." (Norris at Abstract).

85. Norris further describes that one device transmits its location information, and other devices receive this information. The receiving device(s) then display the position of the transmitting device on the receiving device display. The orientation of the receiving device is used to rotate the display so that the relative position of the transmitting terminal is always displayed in such a way that the directional indicator, indicating the direction to the transmitting terminal always points in the direction of the transmitting terminal. For example:

> A first GPS device with the person or object to be located transmits its GPS determined location to a second GPS device. This second GPS device includes a means for receiving the GPS

> determined position of the first GPS device. and also includes means for calculating the relative position of the first GPS device relative to the second GPS device based on a comparison of the received telemetry of the first GPS device and its own GPS determined position. The relative position of the first device is then graphically displayed on an interface of the second GPS device in a manner which eliminates the need for a map in order to travel to the location of the first GPS device. While providing an interface which displays a relative position of the first GPS device. This information remains accurate no matter how the orientation of the second GPS device changes with respect to a compass.
>
> (Norris at Abstract)

86. Norris illustrates the basic system in Figure 8, reproduced below.

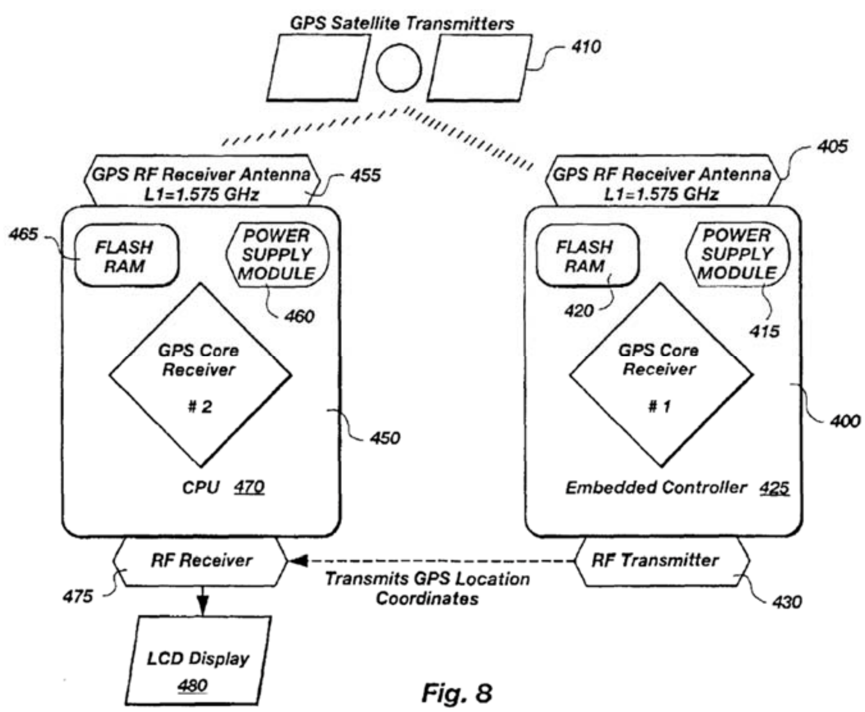


Fig. 8

87. This figure illustrates two terminals (400 and 450), each equipped with a GPS receiver (items 405, and 455). An RF transmitter on terminal 400 transmits

"GPS Location coordinates" to terminal 450. Terminal 450 then displays the location of terminal 400 on the LCD display 480.

88. Norris describes that the user can select which terminal to track by selecting the transmission frequency band associated with that particular terminal. For example:

> A further modification is that the second GPS device 350 is advantageously and selectively tuneable to receive telemetry from a desired frequency. This enables the second GPS device 350 to be be [sic] able to track multiple GPS devices. It is also possible to provide a tuner such that a plurality of GPS devices can be simultaneously tracked and displayed on the second GPS device 350 interface. These features also imply that the first GPS device 340 can advantageously selectively transmit telemetry on a desired frequency.]
>
> (See Norris, col. 6, lines 49-57)

> Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is playing. …
>
> When a golf hole is completed. the golfer tunes a GPS device to the frequency for receiving telemetry data for the next golf hole.
>
> (*See* Norris col. 9, lines 55-65, *portion omitted for clarity*)

89. Since the device will allow the user to track the distance and direction to the other terminal, for example the golf hole described above by Norris, the tuner represents an input device for inputting a destination.

90. Norris describes the terminal includes a compass to provide directional orientation information, so that as the user of one terminal turns in a circle, the display (arrow 354) will always be oriented so that it points in the actual direction of the other terminal. For example:

> Therefore, the present invention envisions that a user will be able to hold the second GPS device 350 and turn in a circle, and the arrow 354 will always point toward the first GPS device 340. This implies that the circle 360, if shown also remains fixed relative to the compass. This ability is a result of an internal compass of the second GPS device 350. The internal compass provides a fixed reference point relative to which the continuously displayed arrow 354 will use to always point toward the first GPS device 340. The feature described above is illustrated, for example, In FIG. 5C. For this drawing, the direction north of the fixed compass 368 is toward the top of the paper. The direction "north" might be true north or magnetic north. The two GPS devices illustrated are the same GPS device 366, but shown in two different positions or orientations relative to the fixed compass 368. What remains constant (as long as the object being tracked does not move) is that the arrow 354 always points due east to some tracked GPS device whose telemetry data has been received by the pictured GPS device 366. Not shown because of the scale of the drawing is the fact that the arrow 354 also points to the same tick mark 362 at approximately 90 degrees, the circle 360 and tick marks 362 also remain fixed relative to the compass 368.
>
> (*See* Norris, col. 7, lines 21-44)

91. This is illustrated in Figure 5C reproduced below.

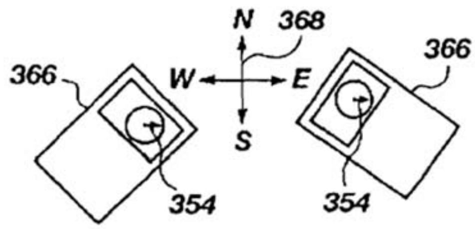


Fig. 5C

92. Norris also describes that the distance to the other terminal can be displayed on the display screen. For example:

> Distance as well as other useful but presently nongraphically displayed information is displayed as text in an unused portion of the LCD screen 352. This information includes but is not limited to the selected telemetry frequency or frequencies of remote first GPS devices 340. It is also possible to choose a units of distance for the displayed distance measurement shown as text so as to conform to user preferences for the U.S. or metric system.
>
> (*See* Norris, col. 7, lines 48-53)

93. Norris also describes a "grid" display wherein the position of the other terminal is displayed overlaid on a "grid" display relating to distance and angle from the receiving terminal. This is illustrated in Figure 6 of Norris, reproduced below.

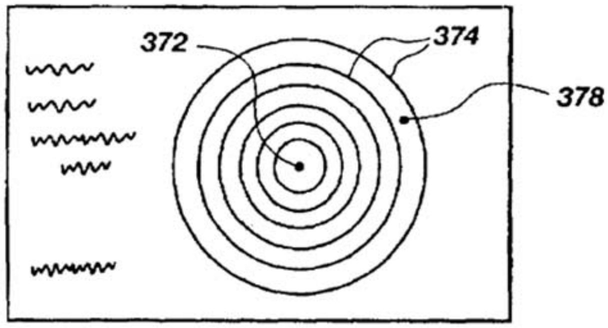


Fig. 6

94. Norris describes this display as follows:

> FIG. 6 illustrates an alternative embodiment of the graphical screen display of FIGS. 5A and 5D. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user. at a cost to the user of more circuitry and sophistication of the GPS devices. More intuitively useful information is displayed on the interface 352 by replacing the direction arrows 354 or 370 with a grid. Centered on the location of the user or second GPS device 35O. represented by some type of mark 372. are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. Finally. some type of mark 378 such as a small circle. square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked.
>
> (*See* Norris, col. 8, lines 7-21)

95. I note too that the angular elements of this "grid" display, while not shown in Figure 6, are indicated in figure 5B, which is an enlargement of Figure 5A referenced in the above citation. Here the angular direction in degrees is indicated by tick marks that represent radial lines drawn from the center of the (polar

coordinate) grid to provide angular information. Figure 5A and 5B are reproduced below for reference.

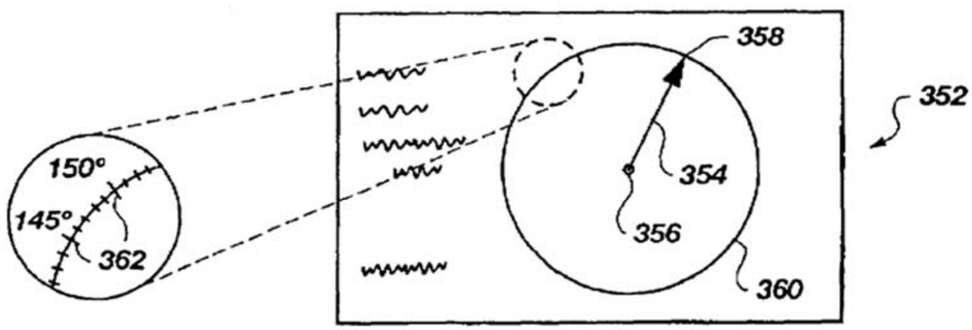


Fig. 5B

Fig. 5A

B. U.S. Patent No. 5,173,709 ("Lauro")

96. Lauro issued on December 22, 1992, from an application filed on June 3, 1991. I understand that Lauro qualifies as prior art under at least 35 U.S.C. §§ 102(a) and (b).

97. Lauro describes "an electronic direction finder (10) includes a navigation receiver (28) and a compass (32) to generate a bearing signal that indicates that direction of a desired destination. The bearing signal is received by a display driver (34) which causes an electronic display (14) to generate a visible image of a rotatable pointer that points in the direction of the user's desired destination." (*See* Lauro at Abstract).

98. Figure 2, reproduced below describes the elements of the system.

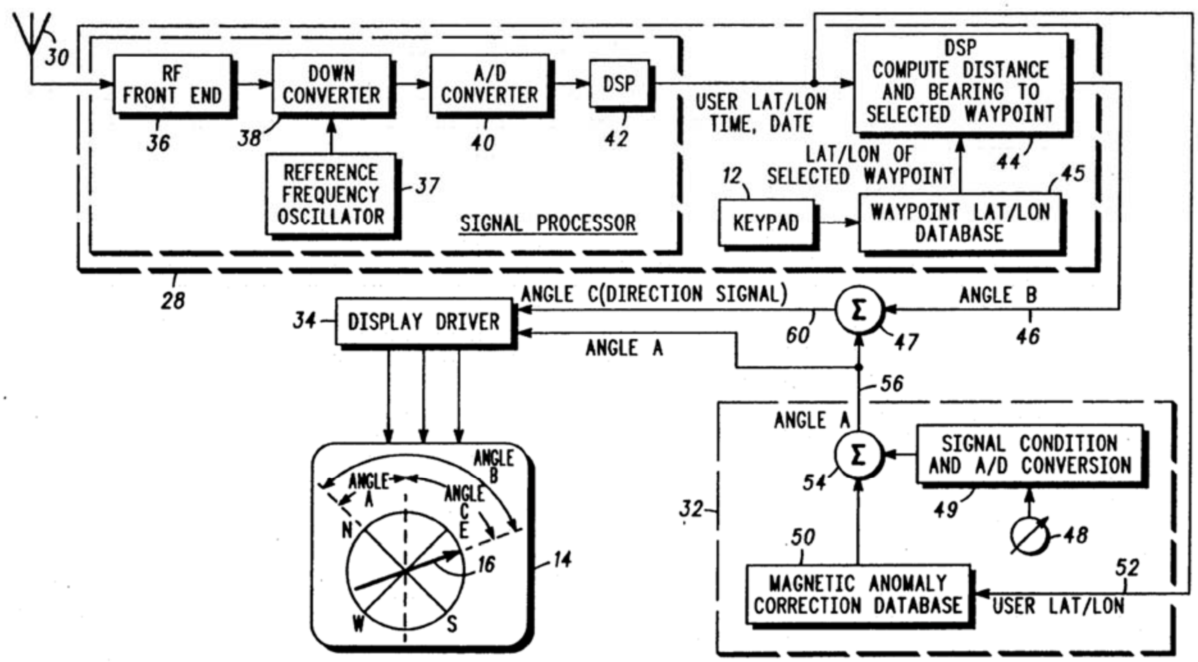


FIG. 2

99. In operation, the user inputs their current position and the position of the destination using the key pad 12. For example:

> The keypad 12 allows a user to input data regarding the latitude and longitude of the user's present position, and the latitude and longitude of waypoints (also referred to herein as "desired destinations"); the keypad may also permit the user to command the direction finder to point in the direction of a specific desired destination that is commonly referred to as "home".
>
> (Lauro col. 1, lines 52-58)

100. Lauro further describes that as the user changes their orientation, that is, their heading, the system will rotate the displayed arrow so that it is always pointing toward the destination. For example:

> Referring now to the display 14, one of its most significant features is that it generates an image of a pointer 16 (preferably

> in the form of the illustrated arrow) that points toward the desired destination selected by the user, irrespective of the user's heading. Herein, the user's heading is considered as parallel to the major axis 18 of the direction finder. Thus, with the user facing in the direction of the axis 18, the pointer 16 clearly indicates that the user should turn to his right approximately 75° in order to be headed directly toward the desired destination. As the user turns in that direction, the head of the pointer 16 automatically moves in a counterclockwise direction. When the user is facing directly toward the desired destination, the pointer 16 will point directly along the axis 18.
>
> (Lauro col. 1, line 65 to col. 2, line 11)

C. U.S. Patent No. 5,592,382 ("Colley")

101. Colley issued on January 7, 1997 from an application filed March 10, 1995. I understand that Colley qualifies as prior art under at least 35 U.S.C. §§ 102(a) and (b).

102. Colley is primarily directed to a navigation display concept that A PHOSITA would understand could be used with a variety of different types of navigation system. For example:

> The present invention is directed to a navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately determine whether the correct course is being traveled, and to inform the user of any directional changes which may be necessary to be directed toward the desired destination. The desired destination is displayed on an electronic charting system by a destination waypoint.
>
> (*See* Colley, col. 2, lines 6-14)

> For example, hikers or horseback riders may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not.
>
> (*See* Colley col. 5, lines 39-42)

103. Colley describes a "directional steering and navigation indicator" (Colley title). Colley further describes the device as follows:

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. The user's position and course are determined by a navigation system and indicated on the display as a directional pointing icon, such as a line or arrow. The destination is displayed as a point.
>
> (Colley at Abstract)

104. Colley describes that the device makes use of navigation equipment such as "GPS receiver or LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer to drive the displays" to provide position, heading course over ground, or COG) and speed as well as to allow the indication of the destination and other waypoints on the display screen. For example:

> Embodiments of the invention operate with navigation hardware (not shown) which is implemented to provide information concerning the user's current position, the user's COG data, and the position/coordinates of the desired destination. For example, the navigation hardware may include a GPS receiver or LORAN

> receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer to drive the displays.
>
> (See Colley, col. 3, lines 31-38)

> In preferred embodiments, a COG indicator 214 is coupled to the current position icon 218 to provide a clear indication of the direction of travel of the user.
>
> (See Colley, col. 3, lines 49-51)

> destination position means for indicating the position of the desired destination;
>
> (See Colley, col. 6, line 16-17)

105. Colley also describes a display, as illustrated in Figure 2, reproduced below.

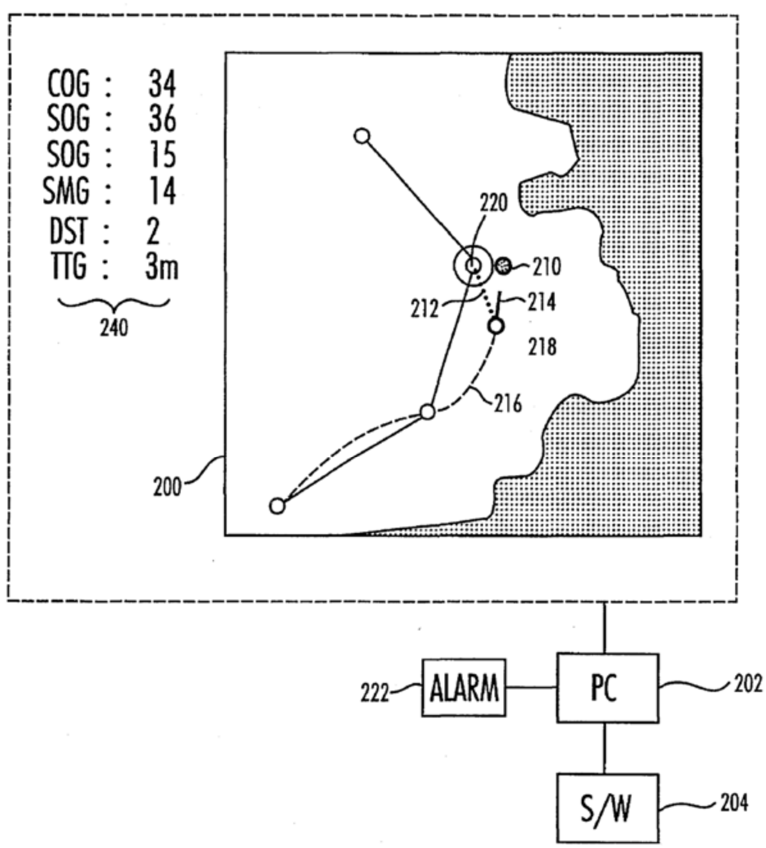


FIG. 2

106. Colley describes the elements of the display. For example:

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), distance to waypoint (DST), and the time to go (TTG). The numerical table or listing 240 is optional in that the numerical data is embodied by the movement of the graphical icons illustrated in the display 200.
>
> (*See* Colley col. 3, lines 19-30)

> Thus, preferably the display 200 shows a graphical representation of numerical data combined with instantaneous course correction information. The actual track 216 of the user is designated as a dotted line. The PCA 210 is shown relative to the user's current position 218 and the destination waypoint 220. A bearing-to-destination (BTD) indicator 212 connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint. In preferred embodiments, a COG indicator 214 is coupled to the current position icon 218 to provide a clear indication of the direction of travel of the user.
>
> (See Colley col. 3, lines 40-51)

107. Thus this display shows the position of the origin or starting point (i.e. the prior waypoints), the position of the next destination (220) (either the final destination, or waypoint destinations, if any), the current position (218) and heading (214, and COG), the distance between the current position and the next destination (DST), and the direction between the current position and the next destination (BTD indicator line 212), as well as the route from the starting point to

the destination (the ensemble of waypoints connected by the bent line in the figure).

108. Colley also describes that prior art systems that, for example illustrate the position and course on a grid display were well known. For example: “FIGS. l(a) and l(b) show a conventional charting display scheme in which two display screens depict graphical and numerical positioning and correction information” (Colley col. 2, lines 46-48).

D. Japanese Publication No. H10-232992 (“Nojima”)

109. Nojima is a laid open disclosure public patent bulletin, published on September 2, 1998 from an application filed on February 19, 1997. I understand that Nojima qualifies as prior art under at least 35 U.S.C. §§ 102(a) and (b).

110. Nojima describes a portable device that is able to determine, for example, based on the travel route and speed, what mode of transport the user is using. The system then retrieves information appropriate to that mode of transport from one or more remote servers, and provides this information to the use. For example, if the user is riding on a train, the system might retrieve train schedule information for that route. If they are walking, it might retrieve information about local businesses.

111. Nojima describes the invention generally as follows:

> An absolute-position computation part 22 calculates the current position based on the output of a DGPS device 12. Additionally, a dead-reckoning-navigation computation part 20 calculates the

> travel speed and travel direction, doing so based on the outputs from a triaxial gyroscope 14 and a triaxial compass 16. A travel mode assessment part 24 discerns the travel mode currently being used, doing so based on the data in a map/transportation system database 18 as well as the current position, travel speed and travel direction. Then, an information-delivery control part 26 creates information with contents that are in accordance with the travel mode, and provides [the information thus created] to the user. Additionally, the communication control part 28 28 switches the communication means according to the travel mode.
>
> (Nojima, means for resolution)

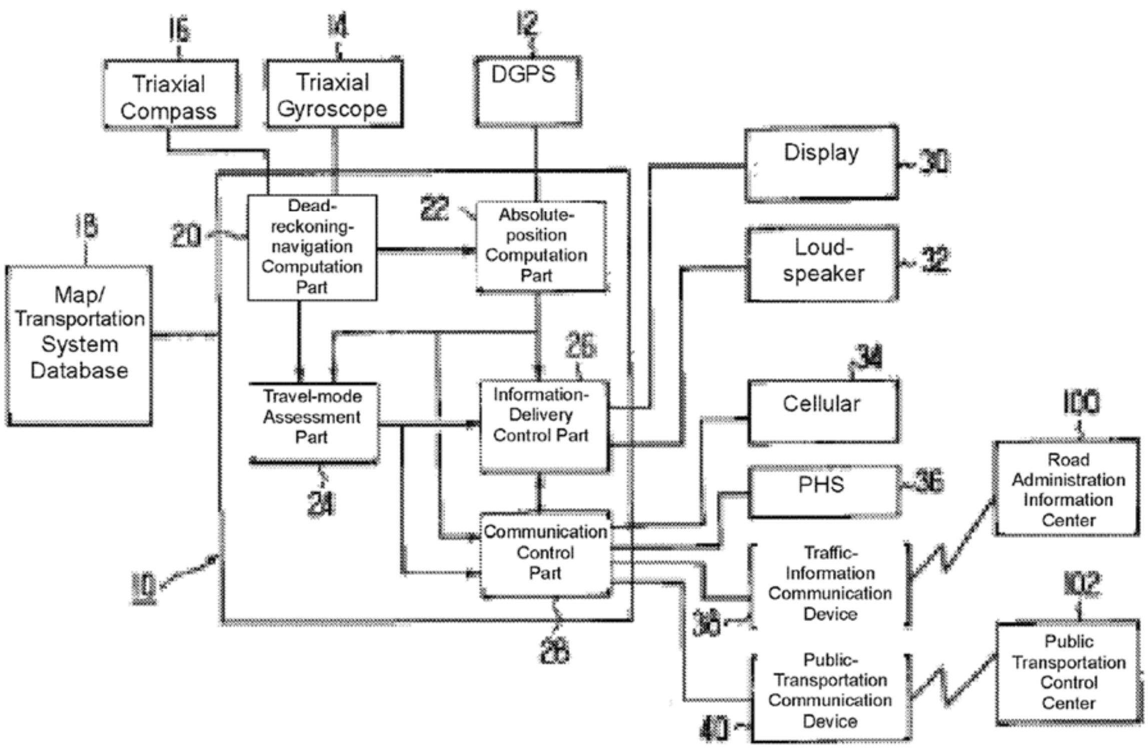
112. Nojima describes that the device is portable. For example: "The mobile terminal device is accommodated within a compact main body so that the user may carry it around. The user may carry a mobile terminal device while traveling through the use of various modes of travel; for example, by walking…" (*See* Nojima [0004])

113. Nojima further describes that the device may be carried by a use while walking. For example:

> The mobile terminal device having the above-mentioned configuration is accommodated within a compact main body (not shown). The user can carry the mobile terminal device while he/she travels on foot or by car, or through the use of a transportation system, such as a railroad train, monorail, aircraft, marine vessel, etc. To be more specific, the present device may be incorporated into an electronic personal organizer, a PDA or a portable type of personal computer. The following is an explanation of the operation of the above-mentioned mobile terminal device
>
> (*See* Nojima [0024])

114. Nojima describes that the device includes position and heading sensors. For example, Figure 1, reproduced below, identifies a differential GPS (DGPS) receiver 12, and a tri-axial compass.

Figure 1



This is described by Nojima as follows:

> Figure 1 shows the overall configuration of the mobile terminal device. The control device 10 is connected to a DGPS device 12, a triaxial gyroscope 14, a triaxial compass 16 and a map/transportation system database 18 so as to thereby control the entire system.
>
> (*See* Nojima, [0014])

> The DGPS device 12 combines error information (which is supplied via FM multiplex broadcast, etc., and is stored in the

> GPS device) with the position data obtained from the GPS device (which detects the current position through the use of signals from satellites) so as to thereby detect the current position more accurately.
>
> (*See* Nojima, [0015])
>
> And, the triaxial compass 16 is a sensor that detects the absolute orientation. Thus, the posture of mobile terminal device is identified based on the output from the triaxial compass 16.
>
> (*See* Nojima, [0016])

115. As can be appreciated in the figure above, the device is connected via a wireless link to one or more servers 100 and 102. This is further described by Nojima:

> Furthermore, a road-information communication device 38 for communicating with the Road Administration Information Center 100, and a public-transportation communication device 40 for communicating with the Public Transportation Control Center 102 are connected to the communication control part 28. The road-information communication device 38 obtain information that is useful for vehicle operations, for example, during a traffic jam. The public-transportation communication device 40 obtains information such as a change in the diagram, etc. It should be noted that these
>
> communication devices may be used to obtain a variety of information to be stored in the map/transportation system database 18. The communication control part 28 controls both
>
> communication devices so as to obtain the necessary information from an outside source. In this event, it controls the switchover of the communication device to be used, doing so in accordance with the travel mode currently being used by the user.
>
> (I Nojima [0023])

Nojima describes that once the position and direction of the device are determined, it then determines the mode of transport being used, and then acquires information from external sources (e.g. servers), which is then presented to the user via the display and loudspeaker. For example:

> [0034] The information-delivery control part 26 creates the guidance information to be provided to the user through the use of the current position and the data in the map/transportation system database 18, whereupon it displays the information on the display unit 30 and outputs it via the loudspeaker 32. In this event, the contents of the guidance information are modified I accordance with the travel-mode discernment result, as follows:
>
> [0035] (1) "Travel on foot":
>
> The display unit 30 displays an enlarged map of the surrounding area of the current position and also a current-position mark. It also displays an indication of the address of the current position, a guide for the surrounding facilities, etc. The loudspeaker 32 outputs notification, such as, "You are at the district number 00 of the Township of 00," or the like. In this way, the local information on the area around the current position is provided during travel on foot (Figure 3 (a)).
>
> (*See* Nojima [0034] – [0035])

116. Nojima also describes that the system switches between communications systems depending on the travel mode. For example:

> Additionally, the communication control part 28 switches the communication means according to the travel mode. It switches to the PHS 36 during travel on foot. Meanwhile, it switches to the mobile phone 34 during travel by car and during the use of public transportation. However, while either one of the

> communication means is in use, the switch is not affected even when there is a change of the travel mode.
>
> (*See* Nojima [0038])

117. I note that Nojima describes three different sources of information: The Road Administration Service Center 100, the Public Transportation Control Center 102, and the Map/Transportation Database System 18. The first of these are described as:

> The communication control part 28 further controls the switching between the road-information communication device 38 and the public-transportation communication device 40 according to the mode of travel. It uses the road-information communication device 38 for communication while the user is traveling by car, but it uses the public-transportation communication device 40 for communication while the user is using a form of public transportation. It uses neither of the communication devices while the user is traveling on foot. And, the information thus obtained is sent to the information-delivery control part 26, whereupon it is displayed on the display unit 30 and announced via the loudspeaker 32, when appropriate.
>
> (*See* Nojima [0039])

118. Nojima also describes the Map/Transportation Database System 18 as:

> And, the map/transportation system database 18 stores data, such as a national map (including road information), address designations, the names of intersections, etc. Furthermore, the map/transportation system database 18 also stores data on public transportation, such as railroad trains, including, for example, the route maps, locations of stations, station names and diagrams (timetables), etc.
>
> (*See* Nojima [0017])

119. As each of these information sources is external to the main processing of the system, in my opinion, under the broadest reasonable interpretation each of them would be identified as a server.

E. U.S. Patent No. 5,552,989 (“Bertrand”)

120. U.S. Patent No. 5,552,989 (“Bertrand”) issued on September 3, 1996 from an application filed on October 27, 1992. I understand that, Bertrand qualifies as prior art under at least 35 U.S.C. §§ 102(a) and (b).

121. Bertrand relates to a “Portable Digital Map Reader” (Bertrand Title), which is described as “...a lightweight and self-contained appliance enabling digital maps to be read and enabling local information to be associated therewith, in particular to replace paper guidebooks, and paper geographical maps, topographical maps or road maps.” (Bertrand col. 1, lines 5-9).

122. The “appliance” described by Bertrand is illustrated in Figure 3, reproduced below.

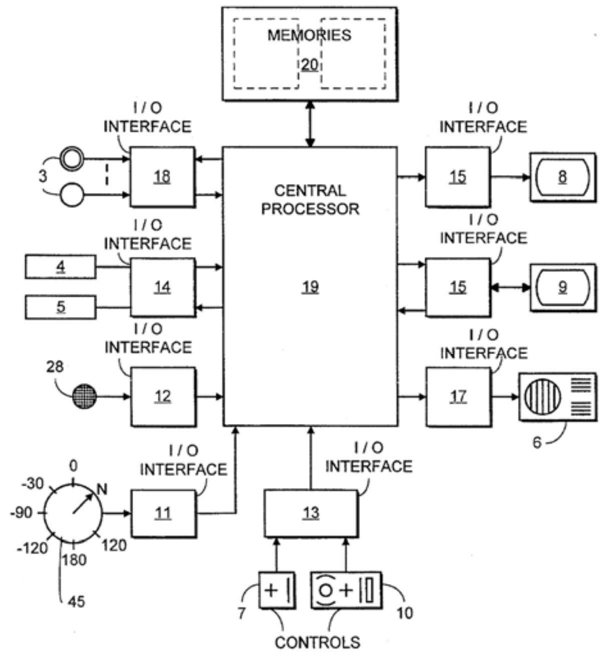


FIG. 3

123. The figure includes eight different I/O interfaces (11, 12, 13, 14, 15 (two), 17, and 18, as follows:

- Interface 11 is connected to an electronic compass 45;
- Interface 12 is connected to a microphone 28;
- Interface 13 is connected to keypad and controls 7 and 10;
- Interface 14 is connected to digital or analog readers 4 and 5
- Interfaces 15 are connected to displays 8, and 9
- Interface 17 is connected to a loudspeaker, and
- Interface 18 is connected to external connectors and sockets.

(*See, generally*, Figure 3 and col. 3, lines 1-30, *errata in element numbering in Figure 3 noted*)

124. Bertrand specifically describes that the map reader uses the compass to rotate the displayed map so that north on the map is always oriented toward north on the earth as the appliance is rotated. For example:

> "One of the objects of the present device is to make north as displayed on the map coincide with geographic north, regardless of the vertical direction of the display screen. Thus, the device includes a compass 45 as a means for measuring the orientation of the portable appliance and for transmitting appropriate display instructions as a function thereof to enable the map to be displayed as a function of said orientation, i.e. to control the display axis of the map."
>
> (*See* Bertrand at col. 5, lines 45-52).

125. This is also illustrated in Figure 6, reproduced below, which shows the map image oriented with this compass north, and the display boxes ACBD and A'B'C'D' shown in different orientations relative to the map.

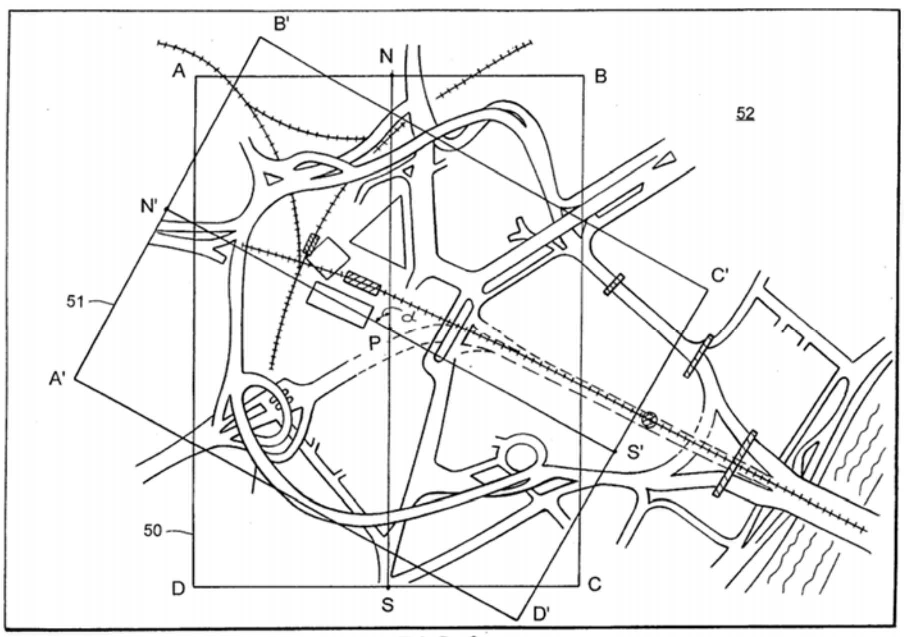


FIG. 6

126. I also that the map display above provides an image of the road network, or grid.

F. US. Patent No. 6,125,326 ("Ohmura")

127. U.S. Patent No. 6,125,326 to Ohmura was filed on September 19, 1997. It claims priority to a Japanese patent (8-259140) which was filed on September 30, 1996. I understand that Ohmura thus qualifies as prior art to the ’317 Patent under at least 35 U.S.C. §§ 102(a) and (e).

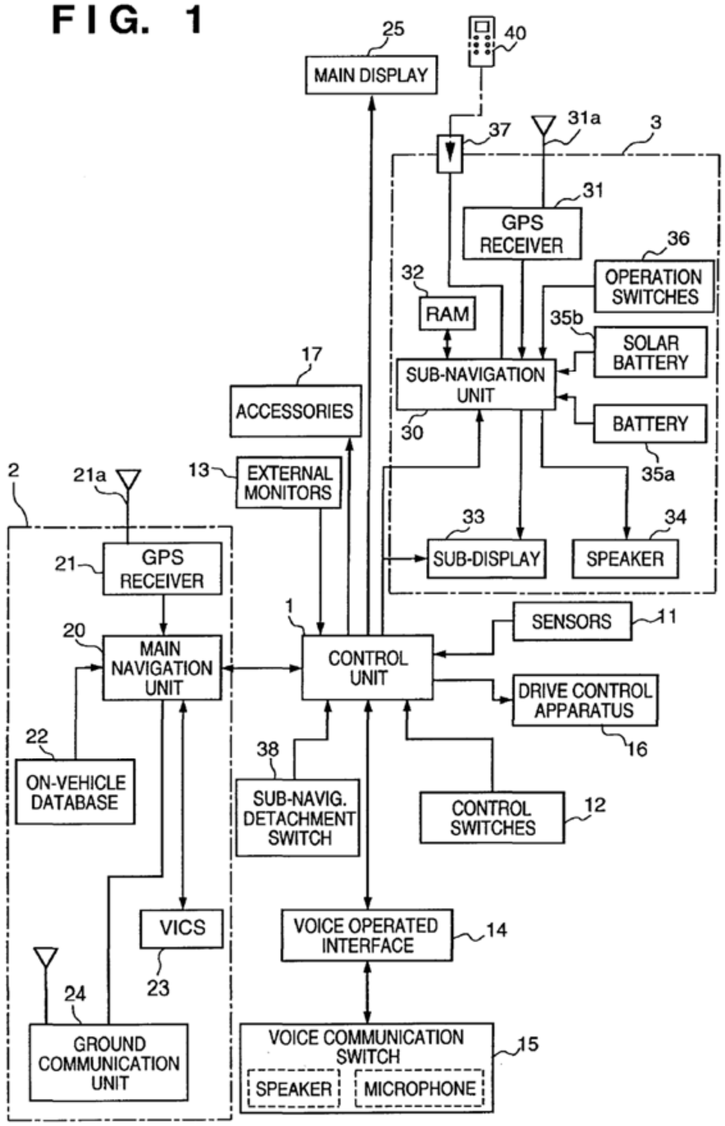
128. Ohmura describes a navigation system that has two primary elements: “a main navigation apparatus 2 which is fixed to a vehicle and runs by a vehicle electric source and a sub-navigation apparatus 3 which is detachable from the vehicle” (*See* Ohmura at abstract), that is, a “portable terminal”.

129. Ohmura specifically describes the purpose of the sub-navigation element as useful for navigating the user while they are walking. For example:

> Accordingly, it is possible to obtain the map information of the current position of the user and its surrounding areas from the sub-navigation apparatus when the user is walking outside of the vehicle.
>
> (Ohmura col. 3, lines 19-22. *See also* col. 3, lines 40-45, col. 4, line 65 to col. 5 line 3, col. 5, lines 32-38, col. 11, line 66 to col. 12, line 7, *etc.*)

130. This sub-navigation unit is illustrated together with the main navigation unit in Figure 1 of Ohmura, reproduced below.

FIG. 1



131. As can be appreciated in the figure, the sub-navigation unit 3 includes a GPS receiver and antenna, a display, a speaker, and a sub-navigation unit 30. The sub-navigation unit 30 is further described as performing the functions of a processor. For example:

> Whereas, when the sub-navig. 3 is detached from the vehicle, the sub-navigation unit 30 starts control operation in response to operations by the operation switches 36 as described above,

> calculates position coordinate data, such as latitude and longitude of the current position, on the basis of data based on the GPS signals received by the GPS receiver 31, controls to display road map, for example, based on the road map data written in the RAM 32 on the sub-display 33, and displays a mark indicating the current position on the road map on the basis of the current position coordinate data, or controls to output the information by voice from the speaker 34.
>
> (Ohmura col. 10, lines 27-38)

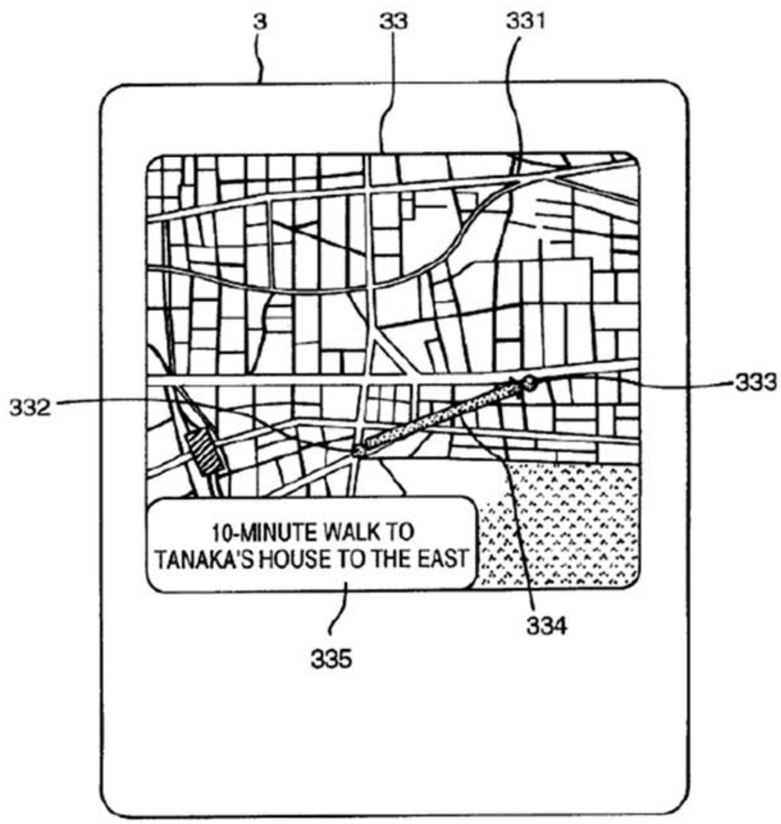
132. Ohmura also describes the display of information on the sub-navigation unit display screen. For example:

> An example of displayed content on the sub-display 33 in such case is shown in FIG. 5. In the displayed image, ***a current position mark 332 indicating the current position of the user*** who is walking, ***a destination mark 333 showing the location of the house of the friend or the acquaintance where the user is to visit***, and ***an arrow 334 showing the direction to the destination from the current position of the user*** are shown in the map image 331 displayed on the sub-display 33. In addition, the distance from the current position of the user to the destination is calculated, a approximately required time to arrive at the destination is calculated on the basis of the calculated distance and a normal walking speed, and character information 335 indicating the above information are displayed together with the map image.
>
> (Ohmura col. 12, lines 53-67, *emphasis added*)

133. Thus, the display includes an indicator denoting the current position of the user who is walking, an indicator denoting the where the user is to visit, and an arrow showing the direction to the destination from the current position of the user. In addition, the distance from the current position of the user to the destination is displayed together with the map image.

134. This display is illustrated in Figure 5, reproduced below.

FIG. 5



135. I also note that the map display above provides the route information (indicated by the arrow 334) overlaid on the road network, or grid.

G. U.S. Patent No. 6,266,614 ("Almbaugh")

136. U.S. Patent No. 6,266,614 ("Almbaugh") was filed on April 20, 1998, and issued on July 24, 2001. It claims priority to Provisional Patent Application No.

60/068,775, filed on Dec. 24, 1997. I understand that Almbaugh thus qualifies as prior art to the ’317 Patent under at least 35 U.S.C. §§ 102(a) and (e).

137. Almbaugh describes an electronic travel guide that provides a display of general directions or specific guidance along with an audio description of nearby points of interest. (*See* Almbaugh at Abstract).

138. Almbaugh describes that the system does not include a road map database, but rather collects and stores waypoints as the vehicle drives. These waypoints together with a database of points of interest can then be used to retrace a route, or to provide general guidance to any selected destination. For example:

> A navigation function includes automatic, intelligent collection of waypoints and general directions without stored, detailed maps of an area for which directions are being provided. Waypoint collections may be employed to document a route travel, to retrace the route, or for other purposes. A directory of locations such as restaurants, filling stations, and the like may be accessed by the travel guide device to determine GPS coordinates for a desired destination for general directions navigation.
>
> (*See* Almbaugh col. 1, line 60 to col. 2, line 1)

139. Almbaugh also describes that the system may include the ability to access additional data remotely using a communications function. For example:

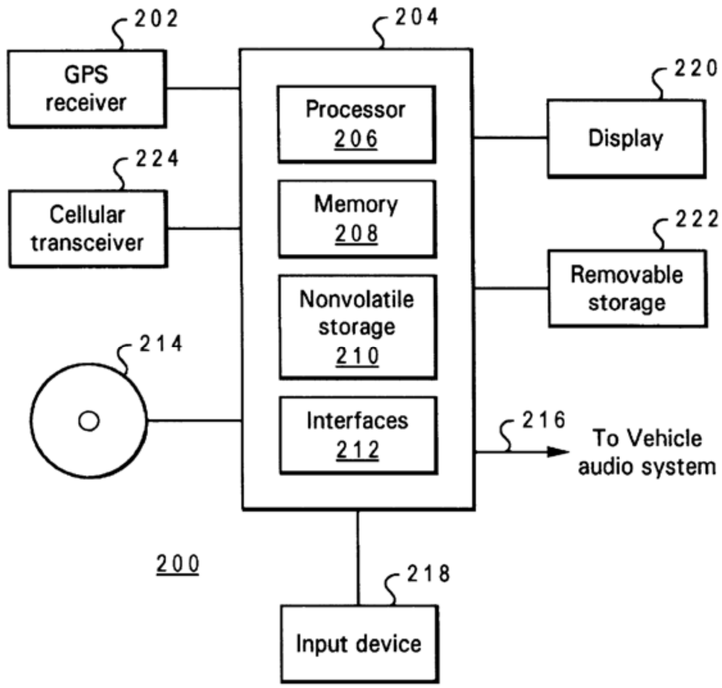
> Communication facilities integrated into the travel guide device provide optional communications services, such as downloading a local directory for an area being entered.

> (*See* Almbaugh col. 2, lines 1- 4)

140. Almbaugh describes that the system, while depicted in the patent as being used in a vehicle, may also be used, while walking. For example:

> Although depicted as being utilized in conjunction with a vehicle, the travel guide device has application in a variety of modes of travel, including land-based vehicles (passenger vehicles, off-road vehicles, etc.), aircraft, boats, transportation by animal and ***walking***.
>
> (*See* Almbaugh col. 2, lines 39- 43, *emphasis added*)

141. In connection with Figure 2 of the patent, reproduced below, Almbaugh describes that the system includes: a GPS receiver 202, for providing GPS coordinates for a current location, a data processing system 204 that includes a processor 206, which may be a conventional portable data processing system such as a laptop or notebook computer, or may be a dedicated data processing system, and memory 208 in which such instructions and relevant data may be stored, a nonvolatile memory 210 containing additional necessary functionality such as, for instance, an operating system and/or a basic input/output system (BIOS), and interfaces 212 to various peripheral devices. (*See e.g.,* Almbaugh col. 2, lines 47-67, col. 3, line 46).



142. Almbaugh also describes that the system includes a database 214. For example:

> Travel guide device 200 also includes a database 214 accessible to data processing system 204 which may be contained on a compact disc (CD), a compact disc read-only memory (CD ROM), or a digital video disc (DVD) accessed through an appropriate peripheral device. Database 214 contains a plurality of information blocks or references for locations within a predefined geographic region, indexed by the GPS coordinates for the respective location. The references (not shown) may be indexed to a specific GPS coordinate (latitude and longitude), or to a range of GPS coordinates.
>
> (*See* Almbaugh col. 3, lines 1-13)

143. Almbaugh also describes that the device includes functions to determine position, direction of travel (*i.e.* heading), speed, and altitude. For example:

> One functional feature of a travel guide device of the present invention which may be selected by the user in the process described above is a narration function, in which the ***vehicle location, direction of travel, speed, and/or altitude***, is ascertained to an acceptable accuracy from data received by the GPS receiver, or from information derived from that data.
>
> (*See* Almbaugh col. 4, lines 6-12, *emphasis added*)

> Knowing the location of a vehicle, determined within an acceptable accuracy from the GPS coordinates retrieved from the GPS receiver, the ***travel guide device may identify the latitude and longitude, altitude, direction of travel and speed of travel at any given instant***.
>
> (*See* Almbaugh Col6. Lines 47-53, *emphasis added*)

144. Almbaugh describes two different, but related navigation functions provided by the device. For example:

> The travel guide device of the present invention utilizes data received from the GPS receiver and information derived from that data to implement at least two navigation options: an advanced method for automatically collecting and storing waypoints representing a route traveled, and the provision of general direction to a destination. Although described as separate options, the two are complementary and may be implementing in an interlocking fashion.
>
> (*See* Almbaugh col. 6, lines 58-65)

145. Almbaugh describes that the first navigation option collects and stores “waypoint” locations as the vehicle moves. This is also depicted in Figures 3F and 3G, reproduced below. For example:

> FIGS. 3F and 3G depict a process for automatic waypoint collection within the travel guide device of the present invention. Simple manual and automatic storing of waypoints derived from a GPS receiver during travel are known in the art. In the travel guide device of the present invention, however, waypoints are automatically collected, analyzed, and refined for their intended purpose. The enhanced waypoint collection is stored as a table of information, within a memory or an storage device. The resulting table of waypoints is a representation of a travelled path with an accuracy appropriate for the intended use.
>
> (*See* Almbaugh col. 7, lines 13-23)

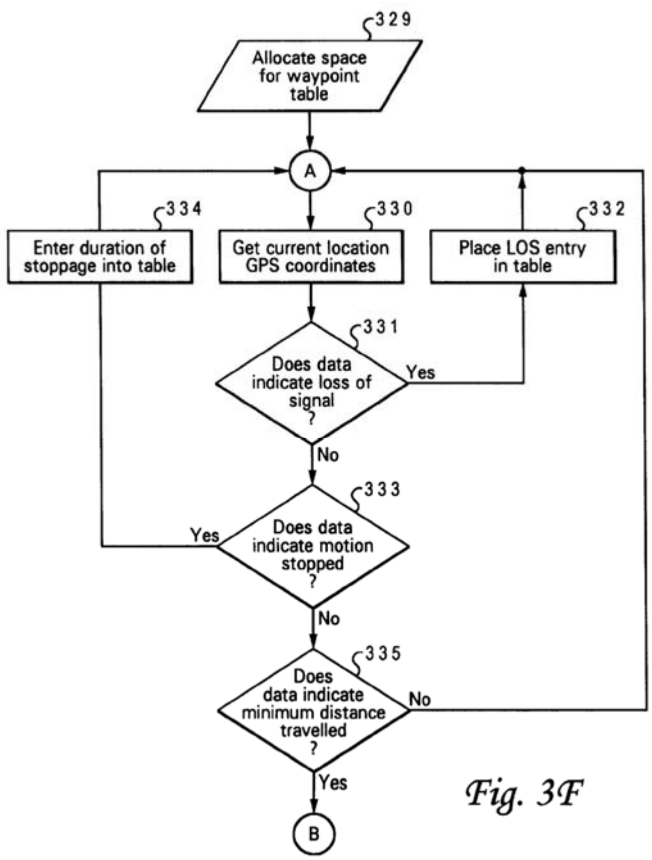


Fig. 3F

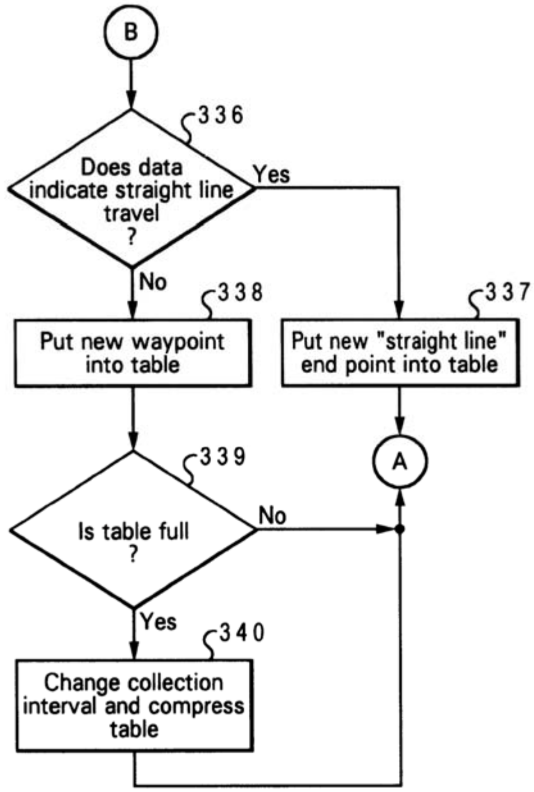


Fig. 3G

146. As illustrated in the figure, this navigation mode begins with the allocation of memory for a waypoint table. As the vehicle moves, the GPS receiver provides the current position and speed of the vehicle. If the GPS signal is lost a "LOS" entry is placed in the waypoint table (steps 331 and 332), and if the vehicle has not moved, the duration of the stoppage is entered into the table (steps 333 and 334). If the GPS position indicates that the vehicle has moved, then the system checks to see if a minimum distance has been traveled (step 335). If not, then the process returns to Step "A" await the next GPS position report. If the minimum distance

has been traveled, the process checks to see if the travel has been in a straight line (step 336). For example:

> If a minimum distance has been traveled since the last waypoint was collected, the process proceeds instead to step 336 depicted in FIG. 3G, which illustrates a determination of whether the collected waypoint lies on a straight line with two previous waypoints. This may be determined by computing the azimuth between the newly collected waypoint and the last previous waypoint, computing the azimuth between the last two previous waypoints, and comparing the two azimuths. A small range of variation, such as 1 ° or less, may be tolerated in determining that the newly collected waypoint lies in a "straight" line with immediately preceding waypoints. This range of variation may be defined by a user to adjust the density of waypoints collected, or may be automatically adjusted by the system.
>
> (*See* Almbaugh Col 7, line 63 to col. 8, line 9)

147. That is, if the direction of the line connecting, for example waypoint n-1, and waypoint n differs from the direction of the line connecting waypoint n and waypoint n+1 by more than a threshold amount (e.g. 1 degree), then waypoint n+1 is stored as a new waypoint in the table

148. A PHOSITA would understand that such an azimuth determination could be made using an electronic compass, or simply by determining and comparing the directions of the line segments between successive pairs of way points.

149. Almbaugh describes that if the direction of travel between these two line segments does not differ by a sufficient amount, then the waypoints are "compressed" to form only a start and end point for the straight line segment. That

is, the middle waypoint is discarded and only the starting and ending waypoints for the straight line segment are stored. For example:

> Waypoints reflecting an essentially straight line of travel are compressed into end points defining the straight line. The tolerance parameters for determining what comprises a "straight" line are also user selectable values.
>
> (*See* Almbaugh Col 8, lines 53-56)

150. Almbaugh also describes that when the waypoint table includes the LOS entry (see above), the subsequent display will simply show a dashed line between the waypoint stored just prior to when the signal was lost, and the waypoint stored just after the signal was restored. For example:

> Whenever the GPS signal is lost for a significant number of collection intervals, a LOS notation is made in the waypoint table. ***Subsequent display of the route taken from the waypoint table may include a straight, dotted line connecting the last waypoint stored before loss of signal and the first waypoint stored after recovery of the signal***, optionally with an appropriate notation indicating loss of signal.
>
> (*See* Almbaugh Col 8, lines 56-63, *emphasis added*)

151. Almbaugh also describes the use of the device for navigation to a general destination. In this mode, the user either enters the coordinates of the desired destination, either by manually entering them, or by selecting them on a map display. Once the destination coordinates are determined, and the current position is determined, the device displays an arrow pointing from the current position to

the destination position, together with a text description of the direction and distance to the destination. For example:

> FIG. 3H depicts a process for destination direction navigation within the travel guide device of the present invention. This process may be initiated by the user selecting the general directions navigation option (see step 327 in FIG. 3E). The process begins at step 341, which depicts retrieval of the GPS coordinates for a desired destination. ***The destination coordinates may be manually entered or ascertained from data within the travel guide device, such as a digitally encoded map indexed by GPS coordinates.*** The process then passes to step 342, which illustrates retrieving the GPS coordinates for the current location. ***The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination***.
>
> (*See* Almbaugh Col 9, lines 25-41, *emphasis added*)

152. Almbaugh also describe a directory function wherein the user may select destinations based on type of point of interest, addresses, and so forth. For example:

> The destination GPS coordinates may be looked up from a directory, or retrieved from a World Wide Web site maintained by the destination enterprise and including the GPS coordinate information in a recognizable format. Thus, the user may enter destination coordinates directly from a Web site.
>
> (*See* Almbaugh Col 9, lines 62-67)

> FIG. 3I depicts a directory function within the travel guide device of the present invention. The travel guide device database may

> include a directory of locations (including GPS coordinates) for a number of places such as: hotels and other places of lodging; restaurants and other places to eat; points of interest; medical facilities, pharmacies, and the like; and other subscribing locations. The directory entry may include enterprise names, addresses and telephone numbers, World Wide Web and/or e-mail addresses, GPS coordinates, and brief descriptions.
>
> (*See* Almbaugh Col 10, lines 15-24)

> The directory function of the travel guide device allows a user to view a list of directory entries for locations within a defined range of the user's current position. The user may select a directory entry as a destination for the travel guide device's navigation facilities, or connect to another communications device using information obtained from the selected directory entry.
>
> (See Almbaugh Col 10, line 64 to Col 11, line 2)

153. Almbaugh describes that this arrow may be superimposed on a map, or that the device may use a voice narration to provide voice directions. For example:

> The arrow displayed to indicate the direction of a desired location may be superimposed on a digitally encoded map within the display.
>
> (*See* Almbaugh Col 9, lines 54-56)

> An arrow on the display points in the general direction of the destination, and text on the display and/or sound from the audio system indicates: "The destination is about two miles ahead and to the left of your current location."
>
> (*See* Almbaugh Col 9, line 67 to col. 10, line 4)

154. Almbaugh also describes that the navigation function may be used to retrace a route that has previously been stored using the waypoint collection process described above. For example:

> The general directions navigation option may be employed to retrace a route previously taken and documented by automatic waypoint collection as previously described. The destination arrow and directions are simply computed for each waypoint, with the next waypoint being selected as a new destination when a current waypoint is reached.
>
> (*See* Almbaugh Col 10, lines 8-14)

H. U.S. Patent No. 5,543,789 ("Behr")

155. U.S. Patent No. 5,543,789 ("Behr") was filed on June 24, 1994. Behr thus qualifies as prior art to the '317 Patent under at least 35 U.S.C. §§ 102(a) and (e).

156. Behr describes a computerized navigation system that includes a base station and several terminal devices. One terminal is a conventional OC that is connected to the base station via a wired connection. The other two terminals are connected to the base station wirelessly. As illustrated in Figure 1 of the patent, reproduced below, the base station is configured with an I/O interface that receives requests from the terminal devices, and formats responses to those requests. The base station includes several other modules. A query resolver, a distance and time estimator, a route calculator, a map database and an interface to third party information sources.

157. Behr summarizes the invention as follows:

> The invention therefore provides a method of providing route guidance information from a base unit to a mobile unit in response to a request from the mobile unit. The method comprises the steps of formatting a query at the mobile unit, the query including the request, communicating the query from the mobile unit to the base unit, and calculating the route guidance information at the base unit in response to the query. The method further comprises the steps of formatting a response to the query at the base unit, the response including the route guidance information, and communicating the response from the base unit to the mobile unit. The remote guidance information may include navigation instructions from an origin to a destination, information about one or more points of interest within the region of an origin or other geographically referenced information
>
> (*See* Behr, col 2, lines 50-64)

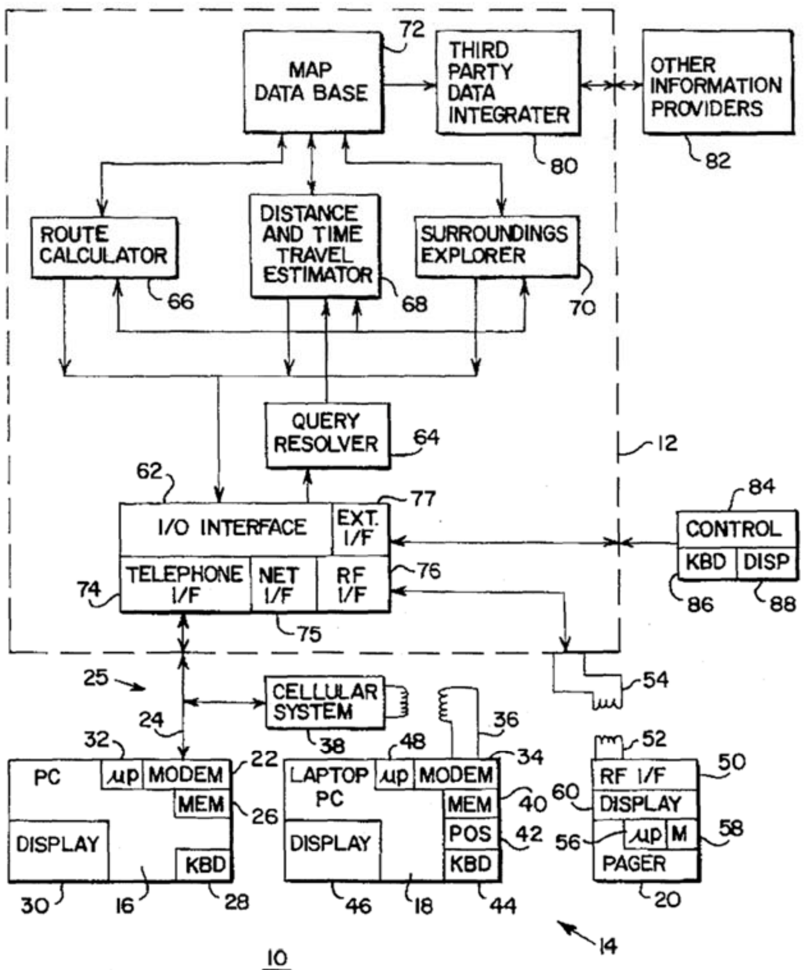


FIG. 1

Behr FIG.1

158. Behr describes the remote terminals as follows:

> The plurality 14 of remote units may include, for example, a desktop personal computer 16, a laptop personal computer 18, or a pager 20.
>
> (*See* Behr, col 6, lines 2-4)

159. Behr describes that one terminal is connected via cellular phone link. For example:

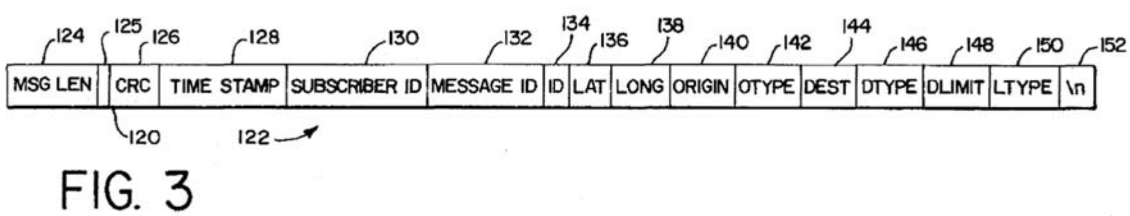
> The I/O interface 62, the modem 34 and the antenna 36 provide a communication means for communicating the origin and the destination from the laptop personal computer 18 to the base unit 12 and for communicating the route from the base unit 12 to the laptop personal computer 18. The I/O interface 62 may further include a network interface 75 for coupling the base unit 12 to one or more wireless or wireline communication networks such as CDPD (cellular digital packet data), TCP/IP (transmission control protocol/Internet protocol), ARDIS or RAM.
>
> (*See* Behr, col 8, lines 7-11

160. Behr describes that the terminal includes position determination capability.

For example:

> The laptop personal computer 18 is another example of a mobile unit which may be used in the system 10. The laptop PC 18 includes a modem 34, a memory 40, a position locator 42, a keyboard 44, a display 46 and a microprocessor 48. 55 The modem 34 is coupled to an antenna 36 for sending and receiving cellular telephone calls in conjunction with the cellular telephone system 38, which is a portion of the commercial telephone system 25.
>
> (*See* Behr, col 6, lines 51-58)

161. Behr describes the typical content of a query. For example, in connection with Figure 3, reproduced below.



Behr FIG. 3

> The method continues at step 102, in which a query is formatted at the remote unit. The query is formatted in accordance with the protocol of the invention, to be described in further detail in conjunction with FIG. 3. The query comprises a serial stream of data and control bits. The control bits, for example, identify the remote user originating the query. The data bits specify the precise request being made of the base unit. For example, the data bits may specify an origin point and a destination point, from which the route calculator 66 (FIG. 1) of the base unit 12 is to calculate the route.
>
> (*See* Behr, col 10, lines 17-27)

162. Behr describes that one mode of operation involves retrieving information about points of interest. For example:

> "If the query requests information about points of interest in the area surrounding an origin, the query is conveyed to the surroundings explorer 70. The surroundings explorer 70 preferably provides an optimized method for searching for points of interest satisfying specified criteria or parameters such as time or distance. For example, the surroundings explorer 70 may locate all McDonald's™ restaurants within a specified driving distance or driving time of a specified origin, or it may locate the McDonald's™ restaurant nearest the specified origin.
>
> (*See* Behr, col 9, lines 22-32)
>
> Behr at 9:22-32

XII. CLAIMS 1-3, 6-8, 10, 15-17, and 20 OF THE '317 PATENT ARE INVALID

163. It is my opinion that claims 1-3, 6-8, 10, 15-17, and 20 of the '317 Patent are invalid because they would have been obvious to a skilled artisan at the time the '317 Patent was filed. Below I provide my analysis of the asserted claims

relative to the prior art from the perspective of a skilled artisan at the time the '317 Patent was filed.

164. As noted above, I understand that the Court has not yet ruled on claim construction, and that some of my opinions may depend on the construction of specific terms in the claims. I reserve the right to amend this report once the claim terms have been construed by the Court.

A. Claims 10, 15-17 and 20 are Invalid for Indefiniteness

i. Claim 10

165. In my opinion, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that claim 10 is invalid because it is indefinite.

166. Claim 10 reads:

> 10. A portable terminal, comprising:
>
> a device for getting location information denoting a present place of said portable terminal;
>
> a device for getting direction information denoting an orientation of said portable terminal;
>
> a device for getting a location information of another portable terminal from said another terminal via connected network;
>
> and a display,
>
> wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation.

167. The claim includes a requirement for four devices. One is the portable terminal itself, and the other three are devices for "getting" three specified information elements:

- Location information denoting a present place of said portable terminal;
- Direction information denoting an orientation of said portable terminal;
- Location information of another portable terminal from said another terminal via connected network

168. The claim then requires the display of the location of the "said present place" (obtained from the location finding device), together with a "said destination", and the display of the relative direction between the portable device and a "said destination".

169. However, the term "said destination" lacks antecedent basis in the claim. That is, there is no earlier reference in the claim to any "destination", or "destination information". There is, for example no requirement as in Claim 1, of "an input device for inputting a destination". Thus, there is no "said destination" to display, and no relative direction from the portable terminal to a destination.

170. While a PHOSITA might speculate that the "destination" was the location of the other terminal, this is clearly identified in the claim as "location information of another portable terminal", not "destination information", and there is no

requirement in the claim that these two information elements be the same. For example, there is no requirement that the portable terminal include some device for selecting or designating the location of the other portable terminal as the destination. In my opinion, the patent itself provides no clarification about this indefiniteness from the perspective of a PHOSITA. For example, the patent, when describing the multiple terminal location embodiment, actually describes the "destination" as the ***phone number*** of the other terminal, not the "location information of the other terminal". For example:

> When sending data, the walker l0a selects the data sending menu from the menus of this service in step 103 and sets the phone number of the walker l0b as the destination. (*See* '317 patent, col. 8, lines 29-31)

171. Further, lacking any guidance that the "said destination" is the "location information of the other terminal", I understand the doctrine of claim differentiation requires that these two terms be treated as different elements, and, there is no indication in the claim that these elements are one and the same.

172. As a result, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 10 is indefinite, and therefore invalid.

ii. Claim 15

173. In my opinion, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 15 is invalid because it is indefinite.

174. Claim 15 reads:

> A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow.

175. Thus, claim 15 requires all of the elements of Claim 1, and adds the further limitation of a device for retrieving a route, and the display of the route and a direction of movement using an arrow.

176. In my opinion, the term "a device for retrieving a route from said present place to said destination" is a means-plus-function limitation, because the term does not have an accepted and ordinary meaning in the art. It does not refer to any specific structure, and a person of skill in the art, would just consider "device" as a generic term like "means." The term "device" is a non-structural, nonce word that is tantamount to using the word 'means' because it does not connote sufficiently definite structure.

177. In my opinion, a PHOSITA reading the specification would not be able to identify any corresponding structure in the specification for "a device for retrieving

a route from said present place to said destination". The only reference to such a retrieving process is the vague and confusing description below:

> In step 109, therefore, the system ***retrieves information of the route between the present place and the destination by means of route retrieving*** and separates information of the route around the present place from this route information and supplies the information. In addition, to supply such compressed information items as 25 and 26, the system requires information of the route between the starting point and the destination. In step 109, ***therefore, the system retrieves information of the route between the starting point and the destination by means of route retrieving.*** In this case, 35 because information of the route between the starting point and the destination remains the same as long as the same route is taken, retrieved information is stored.
>
> (*See* '317 patent Col 7., lines 25-38, *emphasis added*)

178. This description merely restates the function "means of route retrieving" as the basis for obtaining this route information, but does not describe how this would be done, or what specific device would perform this function.

179. A PHOSITA would understand that retrieving a route could mean many things. For example, is the route represented by data that had been stored previously, for example during an earlier trip? Or, is the route calculated by exhaustively exploring the nearly infinite number of possible routes from one place to another?

180. Accordingly, it is my opinion that a PHOSITA would not understand with reasonable certainty what structure is being claimed, and as a result the claim is indefinite and therefore invalid.

181. To the extent that it is determined that the term "a device for retrieving a route from said present place to said destination" is not a means plus function term, it is my opinion that the term is indefinite for lack of written description. As noted above, while the patent specification does describe retrieving a route, the only description of the required "device for retrieving a route from said present place to said destination" is a "means for route retrieving". There is no discussion, for example, of a memory for saving intermediate points (i.e. waypoints) associated with an earlier trip, and a selection device such as a touch screen display for selecting such a saved trip, nor is there any description of a computer processor running an algorithm for sorting through the myriad possible routes between the present place and a selected destination. Accordingly, it is my opinion that a PHOSITA would not understand with reasonable certainty what device is being claimed, and/or how to implement such a device, because there is no written description of this device in the specification, and as a result, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that the claim is indefinite and therefore invalid.

iii. Claim 16

182. In my opinion, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 16 is invalid because it is indefinite.

183. Claim 16 reads:

> A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route.

184. Claim 16 thus adds to claims 1 and 15 the further limitation that the display displays “said grid information of said route”.

185. However, neither Claim 1, nor claim 15 include the term “grid information of said route”. As a result, the term lacks antecedent basis, the claim language supports the conclusion that and the claim is invalid because it is indefinite.

iv. Claims 15-17

186. Claims 15, 16, and 17 all require “a portable terminal with walking navigation”.

187. A PHOSITA would understand that the word “with” here refers to some element or, characteristic that the portable terminal must possess or include. For example, a PHOSITA would understand that “a portable terminal with a display” would mean a portable terminal that included a device for displaying things. This can also be appreciated by considering the alternative, where one might refer to “a

portable terminal without walking navigation", which would obviously not infringe any of these three claims.

188. It is, however, unclear in my opinion what "walking navigation" actually means to a PHOSITA, or what it means for a device to possess it. "walking navigation', as used in the patent, is an activity, not a thing that a device can include. Claims 1 and 10 make this clear. Both of these claims include the phrase "***for*** walking navigation", which limits the elements and characteristics specified in the claim to be used specifically and only for "walking navigation", that is for the purpose of providing navigational information to users who are walking. The patent, however, does not explicitly describe anything called "walking navigation" as an attribute of the portable terminal. The patent does, for example, describe "walking navigation processing" (*See, e.g.,* '317 patent, col. 5, lines 41-42), but this is not what is claimed.

189. As a result, in my opinion" the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that the term "with walking navigation" is indefinite and each of claims 15, 16, and 17 are therefore invalid.

B. Claims 16-17 and 20 are Invalid for Lack of Written Description

i. Claim 15

190. In my opinion, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 15 is invalid because it lacks written description.

191. Claim 15 reads:

> A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow.

192. Thus, Claim 15 requires all of the elements of Claim 1, and adds the further limitation "a device for retrieving a route, and the display of the route and a direction of movement using an arrow."

193. In my opinion Claim 15 lacks written description. While the patent specification does describe retrieving a route, the only description of the required "device for retrieving a route from said present place to said destination" is a "means for route retrieving". For example, the only reference to such a retrieving process is the vague and confusing description below:

> In step 109, therefore, the system ***retrieves information of the route between the present place and the destination by means of route retrieving*** and separates information of the route around the present place from this route information and supplies the information. In addition, to supply such compressed information items as 25 and 26, the system requires information of the route between the starting point and the destination. In step 109, ***therefore, the system retrieves information of the route between the starting point and the destination by means of route retrieving.*** In this case, 35 because information of the route

> between the starting point and the destination remains the same as long as the same route is taken, retrieved information is stored. (*See* '317 patent Col 7., lines 25-38, *emphasis added*)

194. This description merely restates the function "means of route retrieving" as the basis for obtaining this route information, but does not describe how this would be done, or what specific device would perform this function.

195. There is no discussion, for example, of a memory for saving intermediate points (i.e. waypoints) associated with an earlier trip, and a selection device such as a touch screen display for selecting such a saved trip, nor is there any description of a computer processor running an algorithm for sorting through the myriad possible routes between the present place and a selected destination. Accordingly, it is my opinion that a PHOSITA would not understand with reasonable certainty what device is being claimed, and/or how to implement such a device. As a result, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that the claim is indefinite because the term "a device for retrieving a route" lacks written description.

ii. Claim 16

196. In my opinion, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 16 is invalid because it lacks written description.

197. Claim 16 reads:

> A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route.

198. Claim 16 thus adds to claims 1 and 15 the further limitation that the display displays "said grid information of said route".

199. A PHOSITA would not understand what the term "grid information" of a route is. This is not a term of art, and there is no additional explanation or description of any type of "grid information" in the patent, associated with a route or otherwise. In fact, the term "grid information" does not appear anywhere in the specification, and only appears in Claims 16 and 19.

200. The fact that the term modifies the term "grid information" to be "grid information ***of said route***" further confuses the situation. A PHOSITA might assume that "grid information" might, for example be associated with a typical latitude-longitude grid typically found on a map or chart, but this sort of grid information is not associated with a route. It is, instead, associated with a coordinate system for the map, and is unrelated to any route. Similarly, a PHOSITA, reading the patent, might assume that the "grid information" is the road grid formed by the intersections of city streets, but this too is not associated with the route. Like latitude and longitude, the road grind does not change depending on the route, and therefore neither of these could represent "grid information of said

route". Lacking any description in the patent specification, a PHOSITA would be unable to determine what this "grid information" was, and thus the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 16 is indefinite because the term "said grid information of said route" lacks written description.

iii. Claims 17 and 20

201. Claims 17 and 20 both depend, ultimately, from Claim 15 and Claim 1 (I note that Claim 20 depends from Claim 17, but it adds the same exact subject matter to Claim 17 that Claim 17 adds to Claims 1 and 15).

202. Both claims add the further limitation that the route is displayed with a "bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route." Thus, the claims require four additional elements:

- Display of the route using a "bent line";
- Display of the starting point using a symbol;
- Display of the ending point using a symbol;
- Display of the "present place" using a symbol;

203. As an initial matter, neither Claim 1 nor Claim 15 describe any sort of "ending point". They describe a "present place", and a "destination", but do not refer to an "ending point". Since the claim refers to "***the*** ending point", this term

lacks antecedent basis in these claims because, in claims 1 and 15 (and 17) there is no specified "ending point", and in the context of these claims, the destination is not described as "*the* ending point".

204. The only reference to an "ending point" is in the context of the embodiment claimed in Claim 10, wherein the ending point is described as the "partner's present place" in the terminal–to-terminal embodiment. This embodiment also includes descriptions of how the present place and the ending place are presented. Specifically:

> The portable terminal shown in FIG. 5 displays both direction and distance to the partner's present place (destination) from the user's present place (the present place). In this embodiment, ***the starting point (user's present place) of the arrow is represented by a black circle*** and the ***ending point (partner's present place) of the arrow is represented by a white circle*** instead of the arrow used for the "Route Guidance Service".
>
> (*See* '317 patent, col. 8, lines 48-55, *emphasis added*)

205. In addition, and consistent with this description, the patent specification describes how, in other embodiments, the present place is displayed:

> The ***present place on the full route is always represented by a black circle*** on the bent line.
>
> (*See* '317 patent, col. 7, lines 5-6, *emphasis added*)

206. I note, however, that the display of the "starting point" is only described when the present place and the starting point are one and the same. There is no

description for how the starting point is displayed when the present place is separate from the starting point. Because the patent does not describe how the starting point is to be displayed (i.e., what symbol should be used) in the typical situation found in Claims 1 and 15 where the user is being guided from a starting point to a destination, a PHOSITA would not know what symbol to use or how the starting point should be represented on the display. As a result, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 17 and Claim 20 lack of written description of the claimed starting point symbol, and are thus indefinite.

C. Claim 20 is invalid under 37 C.F.R. 1.75(b)

207. I understand that under 37 C.F.R. 1.75 (b) "[m]ore than one claim may be presented [in a patent application] provided they differ substantially from each other and are not unduly multiplied.. However, claim 20 duplicates the subject matter of claim 17, and in my opinion, adds no new subject matter identifiable to a PHOSITA. As a result, the claim language and specification, viewed from the perspective of a PHOSITA, support the conclusion that Claim 20 is invalid under 37 C.F.R. 1.75(b). (

D. Claims 1-3, 10, and 15-16 of the '317 Patent are Anticipated and/or Rendered Obvious by Norris

208. In my opinion Norris anticipates and/or renders obvious Claims 1-3, 10, and 15-16 of the '317 patent. In the sections below I have laid out the basis for my opinion for the various claim elements.

i. Claim 1

209. Claim 1 is an independent claim.

a. "A portable terminal, comprising"

210. Norris discloses a portable terminal. For example, Figure 4, reproduced below indicates two terminals 340 and 350 which are shown as being held by two pedestrian users.

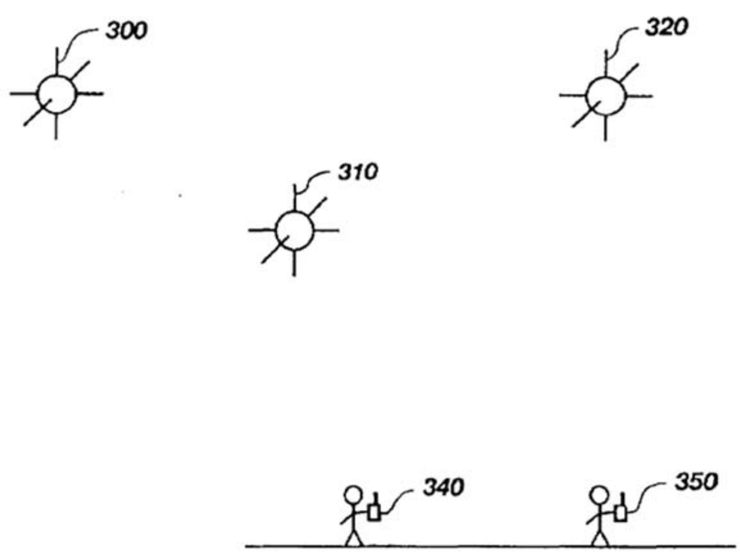
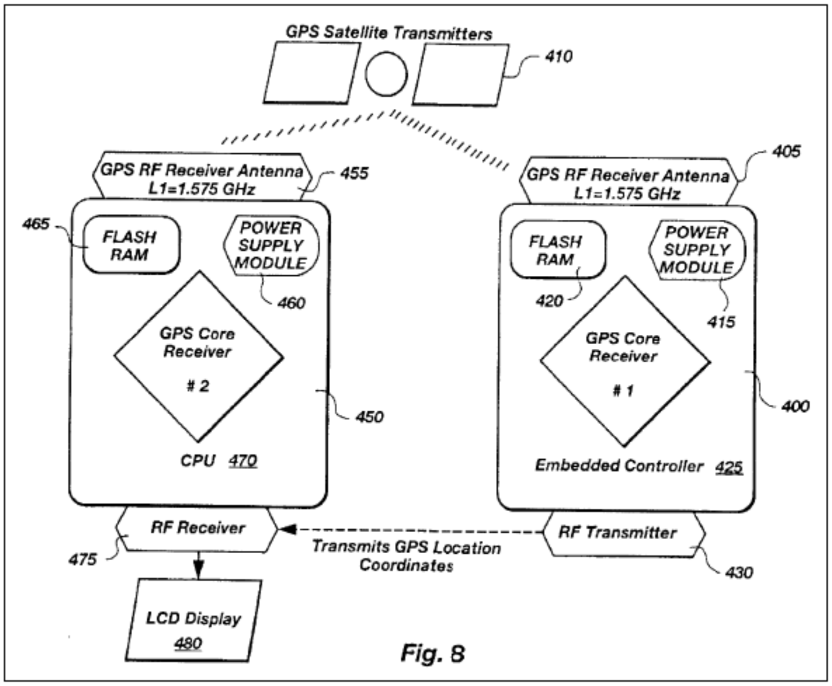


Fig. 4

Norris Figure 4 (showing portable terminals)

211. These devices are illustrated in greater detail in Figure 8 of Norris, reproduced below. Norris states:

> FIG. 8 illustrates in block diagram form the basic components which are used in a preferred embodiment of the GPS devices 340. 350 receivers of the present invention.'
>
> (*See* Norris, col. 9, lines 24-26)



Norris Fig. 8

b. a device for getting location information denoting a present place of said portable terminal

212. Norris discloses a device for getting location information denoting a present place of said portable terminal. For example, Figure 4, reproduced below, illustrates the portable terminals 340 and 350 together with GPS satellites 300 to 330.

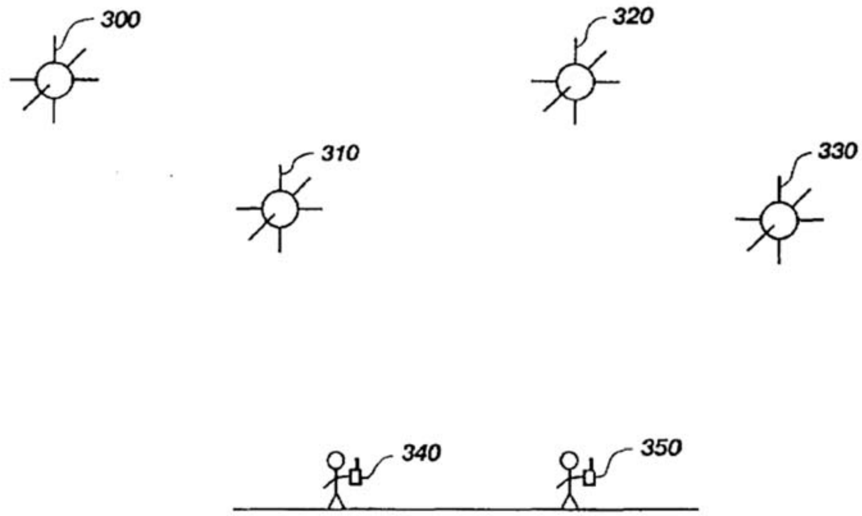


Fig. 4

Norris FIG. 4.

213. Norris describes that the portable devices are able to determine their respective positions. For example:

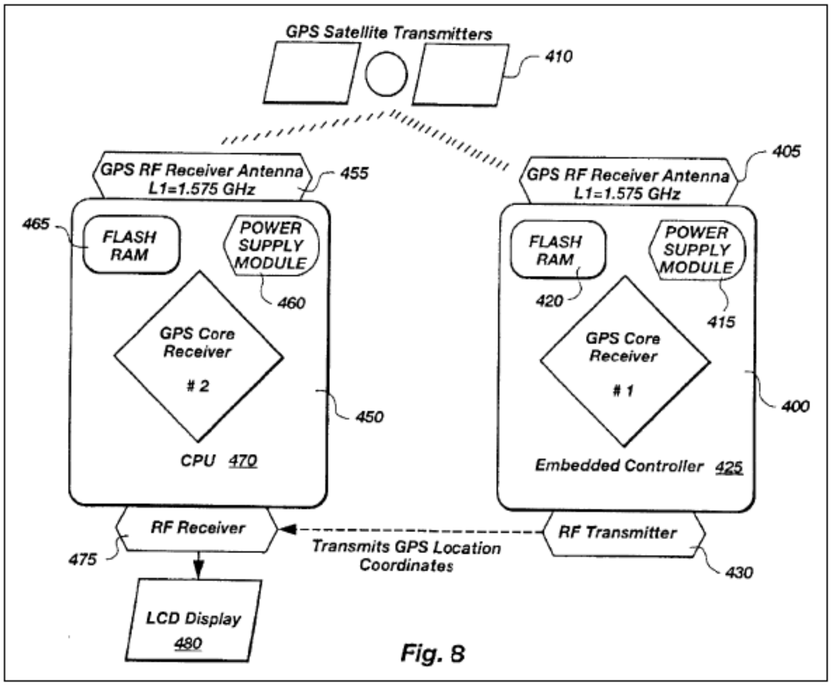
> "The first and second GPS devices are **capable of determining their location in terms of longitude and latitude** according to the methods well known to those skilled in the art through triangulation (location) and quadrangulation (location and elevation) formulas. The innovation of the present invention begins with the first GPS device 340 being modified to be a transceiver so as to transmit this location or location and elevation as telemetry data. Another point of novelty is that the second GPS device 350 is modified not only to receive GPS signals, but also to receive this telemetry data from the first GPS receiver."
>
> (*See* Norris, col. 6, lines 38-48, *emphasis added*)

214. Norris also provides a detailed figure showing the internal components of portable devices 340 and 350. For example:

> "FIG. 8 illustrates in block diagram form the basic components which are used in a preferred embodiment of the GPS devices

> 340, 350 receivers of the present invention. ***A first GPS device 400 comprises an RF receiving antenna 405 tuned to the GPS satellite broadcasting frequency of 1.575 GHz for receiving clock signals from the GPS Satellite transmitters 410 in orbit***. The first GPS device 400 contains a power supply module 415 and flash RAM 420 for storing computations. ***The GPS triangulation or quadrangulation calculations are made by an internal embedded controller 425 or microprocessor which uses GPS signals to calculate its location in terms of longitude and latitude***. This location is transmitted by means of an RF transmitter 430 to a second GPS device 450. ***This second GPS device 450 is similar to the first GPS device 400 in that the second device 450 also receives GPS satellite signals through an antenna 455, and contains a power supply 460 and flash RAM 465.*** However, the second GPS device 450 has a CPU 470 capable of handling more diverse tasks than the embedded controller 425 of the first GPS device 400. In addition, the second device 450 has an RF receiver 475 for receiving the transmitted location of the first GPS device 400."
>
> (*See* Norris, col. 9, lines 24-45, *emphasis added*)

215. Figure 8 is reproduced below.



Norris FIG. 8.

c. a device for getting direction information denoting an orientation of said portable terminal

216. Norris discloses a device for getting a direction information denoting an orientation of said portable terminal. Specifically, Norris describes that each GPS device includes an internal compass. For example:

> "This ability is crucial because the ***orientation of the second GPS device 350 relative to a compass may be changing constantly.*** Therefore, the present invention envisions that a user will be able to hold the second GPS device 350 and turn in a circle, and the arrow 354 will always point toward the first GPS device 340. This implies that the circle 360, if shown, also remains fixed relative to the compass. This ability is a result of an internal compass of the second GPS device 350. ***The internal compass provides a fixed reference point relative to which the continuously displayed arrow 354 will use to always point toward the first GPS device 340***."

(*See* Norris, col. 7, lines 18-29, *emphasis added*)

217. A PHOSITA would understand that a compass is a device for determining the orientation of the earth's magnetic field, and as such typically indicates the direction of magnetic north on the earth. This a compass is able to determine the orientation of a device relative to magnetic north on the earth. For example, Ylin Zhao[4] describes a compass as follows: "A magnetic compass measures the Earth's magnetic field. When used in a positioning system, a compass measures the orientation of an object (such as a vehicle) to which the compass is attached. The orientation is measured with respect to magnetic north"

d. an input device for inputting a destination

218. Norris discloses a tuner device for inputting a destination. Specifically, Norris describes that the user may use the tuner to select a frequency so that the radio receiver in the device will receive signals transmitted by a specific device. This device may be another mobile terminal, for example one that the user is seeking to reach, or it may be a fixed location, such as a golf hole. For example:

> "The system would further ***include the ability of the second GPS device to tune*** to a signal broadcast by different GPS transceiver devices. By ***selectively tuning to the signal of a desired GPS***

[4] Vehicle Location and Navigation Systems, by Ylin Zhao, © 1997, Artech House, Inc. ISBN 0-89006-861-5, Page 56.

device, a distance of. direction to and elevation variance of a plurality of different GPS devices is possible."

(*See* Norris, col. 3, line 65 to col. 4, line 2, *emphasis added*)

"A further modification is that ***the second GPS device 350 is advantageously and selectively tuneable to receive telemetry from a desired frequency***. This enables the second GPS device 350 to be be [sic] able to track multiple GPS devices. It is also ***possible to provide a tuner*** such that a plurality of GPS devices can be simultaneously tracked and displayed on the second GPS device 350 interface. These features also imply that the first GPS device 340 can advantageously selectively transmit telemetry on a desired frequency."

(*See* Norris, col. 6, lines 49-57, *emphasis added*)

"A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. **A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole** on which the golfer is playing."

(*See* Norris, col. 9, lines 55-60, *emphasis added*)

"Furthermore, not only would **selective tuning** to receive different GPS signals be possible, but GPS receivers could also selectively transmit on desired frequencies

(*See* Norris, col. 10, lines 2-4, *emphasis added*)

"The relative position indicating system of claim 9 wherein the at least another ***one of the plurality of GPS devices further comprises means for selectively tuning said receiving means to receive a desired telemetry frequency***."

(*See* Norris, Claim 10, *emphasis added*)

> "While the preferred embodiment has discussed a first GPS device 350 which does not receive but only transmits telemetry data, and a second GPS device 350 which does the reverse, it should be obvious that the second GPS device 350 can be modified to transmit as well as to receive telemetry data, and that more than one of these modified second GPS 350 type devices can be used. ***This enables the users of a system of two second GPS type devices 350 to simultaneously move toward each other as depicted in FIG. 10***."
>
> (*See* Norris, col. 7, lines 56-65, *emphasis added*)

219. A PHOSITA would have found it obvious to use the frequencies of the various GPS units as names of destinations, as opposed to the destinations themselves. For example, a PHOSITA would understand that an address is an unambiguous name for a place so that a user seeking to go to a place can use the address as a type of name for that place. Similarly, many landmarks are identified by a name that has no direct relation to the specific location of the landmark (e.g., the geographic coordinates of the landmark). Thus, a PHOSITA would understand that using a frequency as a name for a destination would be no different than using any other type of name to represent the destination.

e. a display

220. Norris discloses a display. For example:

> "Finally, the second GPS device 450 advantageously has an ***LCD interface 480*** for indicating to the user the relative position of device 400 relative to the second GPS device 450."
>
> (*See* Norris, col. 9, lines 45-48, *emphasis added*)

> "Specifically, the interface 352 of the second GPS receiver is shown in FIG. 5A and is comprised of ***an LCD screen 352***, such as the type used in portable notebook computers but smaller. The interface 352 consists of an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."
>
> Norris at 6:66-7:12.
>
> (*See* Norris, col. 6, line 66 to col. 7, line 12)
>
> *See also* Norris Figure 8*, Id.*

f. "wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation"

221. Norris discloses a display that "displays positions of said destination and said present place to said destination". For example:

> "Finally, the second GPS device 450 advantageously has an LCD interface 480 for ***indicating to the user the relative position of device 400 relative to the second GPS device 450***."
>
> (*See* Norris, col. 9, lines 45-48, *emphasis added*)

> "After receiving the telemetry transmission of the first GPS device 340, device 350 calculates a relative distance between the GPS receivers 340 and 350 by comparing absolute longitudes and latitudes. ***The interface of the second GPS device 350 then graphically displays the position of the first GPS device 340 relative to the second GPS device 350*** in an intuitive manner which facilitates immediate travel to the first GPS device 340 without consulting a map."
>
> (*See* Norris, col. 6, lines 58-65, *emphasis added*)

> "FIG. 6 illustrates an alternative embodiment of the graphical screen display of FIGS. 5A and SD [sic]. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user, at a cost to the user of more circuitry and sophistication of the GPS devices. More intuitively useful information is displayed on the interface 352 by replacing the direction arrows 354 or 370 with a grid. Centered on ***the location of the user or second GPS device 350***, represented by some type of mark 372, are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. ***Finally, some type of mark 378 such as a small circle, square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked***."
>
> (*See* Norris, col. 8, lines 7-21, *emphasis added*)

222. This is illustrated by Figure 6, reproduced below.

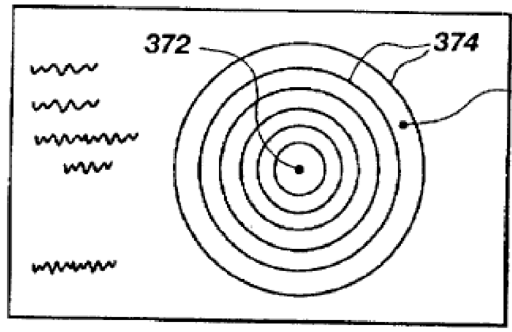
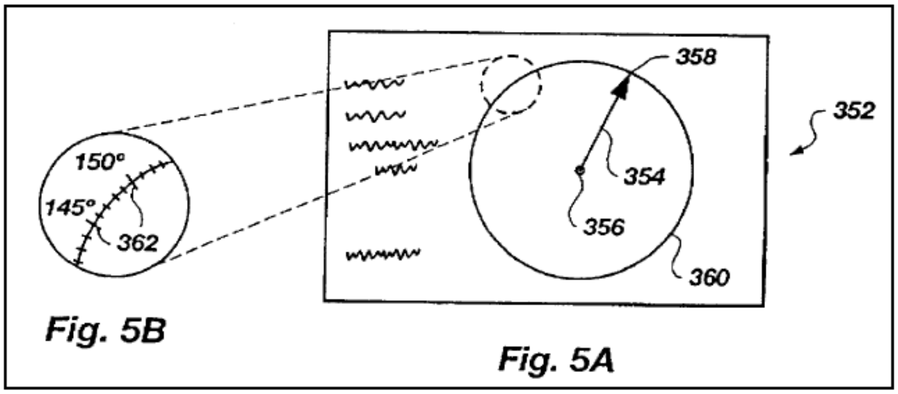


Fig. 6

223. Norris further discloses a display that displays "a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation". For example:

> "The interface 352 consists of an arrow 354, ***an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356***. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)



Norris FIG. 5A, FIG. 5B.

224. Norris describes that as the device is rotated, the displayed arrow will stay pointing at the other GPS device, and thus the display will change, that is the direction to the destination relative to the orientation of the device will change, as the device orientation changes. For example:

> "The feature described above is illustrated. for example. in FIG. 5C. ***For this drawing. the direction north of the fixed compass 368 is toward the top of the paper***. The direction "north" might be true north or magnetic north. ***The two GPS devices illustrated are the same GPS device 366. but shown in two different positions or orientations relative to the fixed 35 compass 368***. What remains constant (as long as the object being tracked does not move) is that the arrow 354 always points due east to some tracked GPS device whose telemetry data has been received by the pictured GPS device 366. Not shown because of the scale of the drawing is the fact that the 40 arrow 354 also points to the same tick mark 362 at approximately 90 degrees. the circle 360 and tick marks 362 also remain fixed relative to the compass 368."
>
> (*See* Norris, col. 7, lines 30-43, *emphasis added*)

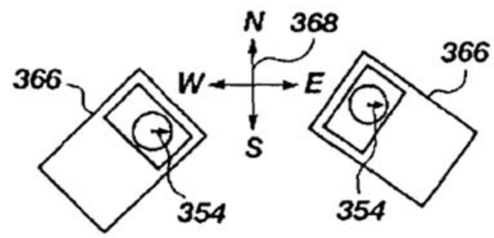


Fig. 5C

225. Norris discloses a portable terminal for walking navigation. For example, Figure 4, reproduced below indicates two terminals 340 and 350 which are shown as being held by two ***pedestrians (i.e. "walking")*** users.

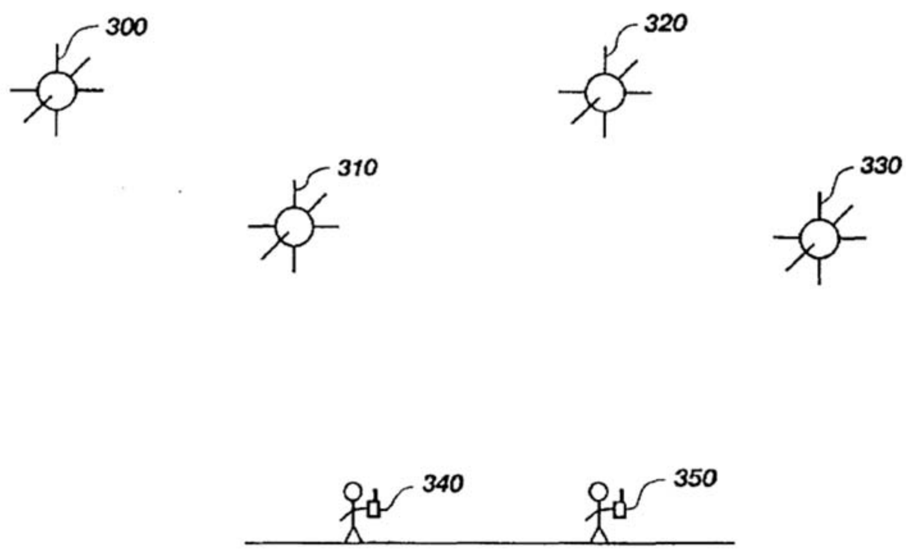


Fig. 4

Norris Figure 4

226. I note that because Norris illustrates the device being used by a user who is walking, it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

ii. Claim 2

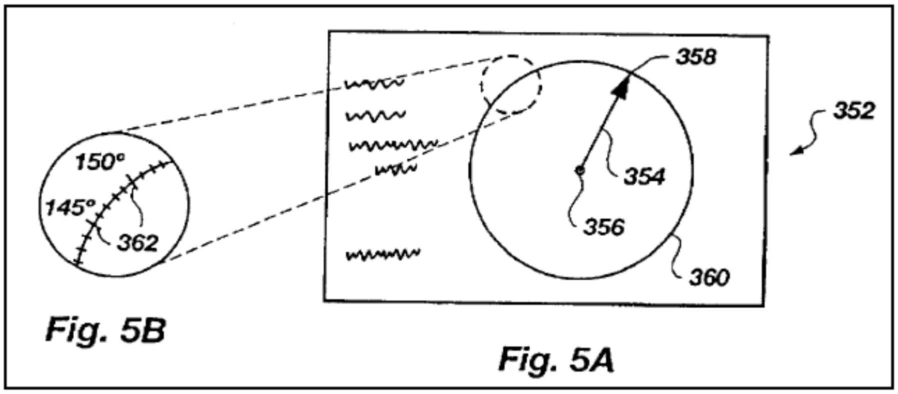
a. A portable terminal according to claim 1, wherein said direction from said present place to said inputted destination is denoted with an orientation of line

227. Claim 2 depends from Claim 1, and adds the further limitation "wherein said direction from said present place to said inputted destination is denoted with an orientation of line "

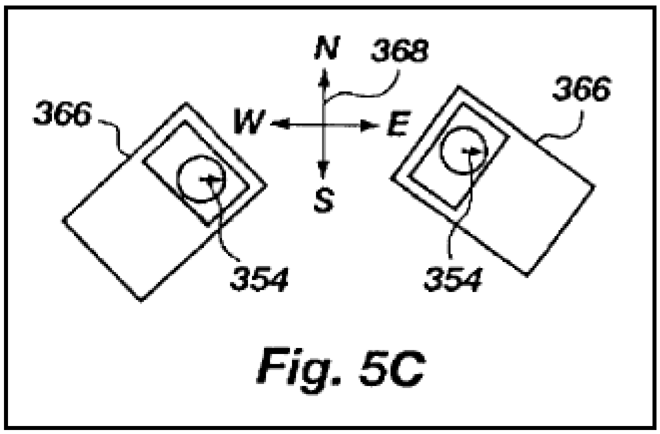
228. Norris discloses that the direction from the current location ("present place") and the other GPS device (inputted destination) is denoted by a line oriented in the direction of the destination. For example:

> "The interface 352 consists of ***an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device*** 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)

229. The "line" oriented to point in the direction of the destination is also illustrated as item 354 in Figures 5A, and 5C, reproduced below.



Norris FIG. 5A; FIG. 5B.



Norris FIG. 5C

"The feature described above is illustrated, for example, in FIG. 5C. For this drawing, the direction north of the fixed compass 368 is toward the top of the paper. The direction "north" might be true north or magnetic north. The two GPS devices illustrated are the same GPS device 366, but shown in two different positions or orientations relative to the fixed compass 368. What remains constant (as long as the object being tracked does not move) is that ***the arrow 354 always points due east to some tracked GPS device whose telemetry data has been received by the pictured GPS device 366***. Not shown because of the scale of the drawing is the fact that the arrow 354 also points to the same tick mark 362 at approximately 90 degrees, the circle 360 and tick marks 362 also remain fixed relative to the compass 368."

(*See* Norris, col. 7, lines 21-44, *emphasis added*)

iii. Claim 3

a. A portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number

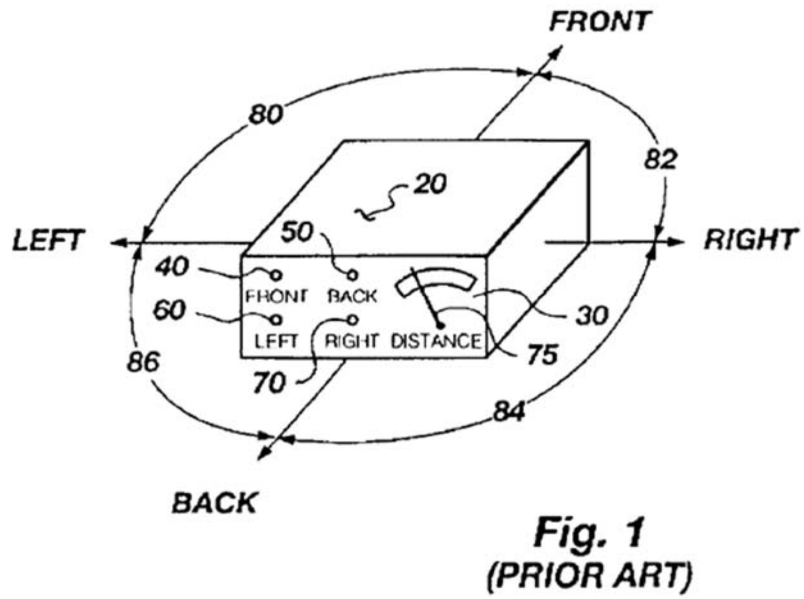
230. Claim 3 depends from Claim 1, and adds the further limitation "wherein a distance between said present place and said destination is denoted with a number."

231. As described above, Norris Anticipates Claim 1.

232. Norris discloses that the distance to the other device (destination) may be indicated in several ways. First, Norris discloses that indicating the distance to a destination was well-known in the art, and thus would have been obvious to a PHOSITA. For example, Norris discloses that the prior art included a "distance indicator".

> A ***distance indicator 75 also shows a relative distance to the transmitter 10*** by indicating the strength of the signal received. (*See* Norris, col. 5, lines 7-9, *discussing prior art systems, emphasis added*)

233. This distance indicator is shown in Figure 1, reproduced below.



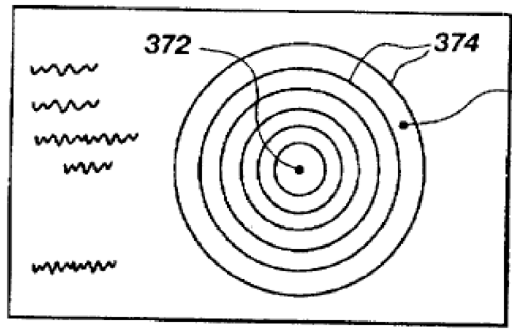
Norris Fig. 1

234. Norris also describes that the distance to the other device (destination) may be indicated in text on the display. For example:

> ***Distance, as well as other useful but presently nongraphically displayed information is displayed as text in an unused portion of the LCD screen 352***. This information includes but is not limited to the selected telemetry frequency or frequencies of remote first GPS devices 340. It is also possible to choose a units of distance for the displayed distance measurement shown as text so as to conform to user preferences for the U.S. or metric system."
>
> (*See* Norris, col. 7, lines 48-55, *emphasis added*)

235. Norris also discloses a graphical means for indicating the distance to the other terminal (destination). In this case, the display is configured with concentric rings indicating increments of distance from the current location 372, which is

indicated at the center of the rings, and the other terminal 378. This is illustrated in Figure 6, reproduced below.



Norris Fig. 6

236. Norris also describes this display. For example:

> FIG. 6 illustrates an alternative embodiment of the graphical screen display of FIGS. 5A and SD [sic]. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user, at a cost to the user of more circuitry and sophistication of the GPS devices. More intuitively useful information is displayed on the interface 352 by replacing the direction arrows 354 or 370 with a grid. Centered on ***the location of the user or second GPS device 350***, represented by some type of mark 372, are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. ***Finally, some type of mark 378 such as a small circle, square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked***.
>
> (*See* Norris, col. 8, lines 7-21, *emphasis added*)

237. Norris also describes a distance and elevation display wherein the location of the other terminal (destination) can be shown in distance and vertical elevation. For example, as shown in Figures 7A and 7B reproduced below.

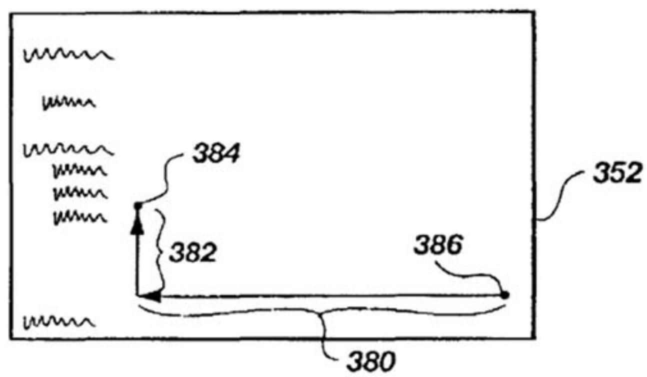


Fig. 7A

Norris Fig 7a

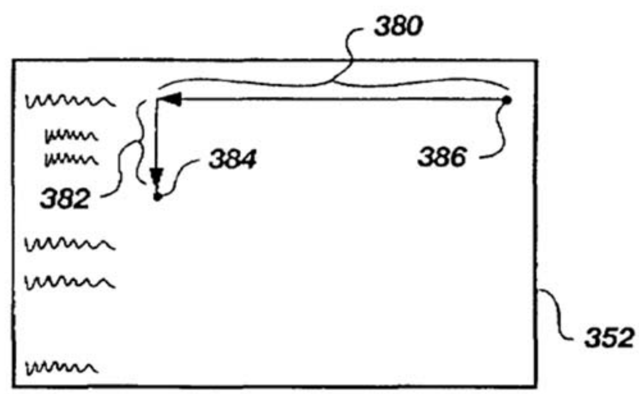


Fig. 7B

Norris Fig 7b,

238. Norris describes this display:

> Therefore, graphical display of elevation relative to distance is provided by toggling between a screen providing graphical

> direction information (FIG. 5A) or graphical direction and distance information (FIG. 6) to a screen as shown in FIGS. 7 A or 7B. ***This screen 352 displays the horizontal distance to travel 380 on the horizontal axis 380. and an elevation variance 382 when on a meaningful scale.***
>
> (*See* Norris, col. 9, lines 1-7, *emphasis added*)

239. Norris also provides a typical application of the invention which includes knowing the distance and direction to a golf hole that is not visible from the current location.

> Variations on the preferred embodiment are possible depending upon the particular application of the present invention. A particular example of ***an application for which the present invention is particularly suited is for a golf course***. A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is playing. I***f the golf hole 510 is obscured by a hill or foliage 540. the golfer 550 will always know the precise distance and direction to aim***, and consequently will be better able to choose a club.
>
> (*See* Norris, col. 9, lines 51-63, *emphasis added*)

iv. Claim 10

240. Claim 10 is an independent claim.

a. A portable terminal, comprising:

241. This element is common with Claim 1, See Claim 1 analysis.

b. a device for getting location information denoting a present place of said portable terminal;

242. This element is common with Claim 1, See Claim 1 analysis.

c. a device for getting direction information denoting an orientation of said portable terminal;

243. This element is common with Claim 1, See Claim 1 analysis.

d. a device for getting a location information of another portable terminal from said another terminal via connected network;

244. Norris discloses a device for getting a location information of another portable terminal from said another terminal via connected network. Specifically, Norris discloses a radio receiver that is tuned to the transmission frequency of the other terminal, so that it can receive broadcast of position from the other terminal. For example:

> "The GPS triangulation or quadrangulation calculations are made by an internal embedded controller 425 or microprocessor which uses GPS signals to calculate its location in terms of longitude and latitude. This location is transmitted by means of an ***RF transmitter 430 to a second GPS device 450***." (*See* Norris, col. 9, lines 32-37, *emphasis added*)

> "In addition, ***the second device 450 has an RF receiver 475 for receiving the transmitted location of the first GPS device 400***." (*See* Norris, col. 9, lines 43-45, *emphasis added*)

> "A further modification is that the ***second GPS device 350 is advantageously and selectively tuneable to receive telemetry from a desired frequency. This enables the second GPS device***

> ***350 to be able to track multiple GPS devices***. It is also possible to provide a tuner such that a plurality of GPS devices can be simultaneously tracked and displayed on the second GPS device 350 interface. These features also imply that the first GPS device 340 can advantageously selectively transmit telemetry on a desired frequency."
>
> (*See* Norris, col. 6, lines 49-57, *emphasis added*)
>
> "Returning now to the system of GPS devices, ***the second GPS device 350 is constantly receiving updated telemetry data from the first GPS device 340*** and from the GPS satellites 300, 310, 320, 330 overhead."
>
> (*See* Norris, col. 7, lines 13-16, *emphasis added)*
>
> "While the preferred embodiment has discussed a first GPS device 350 which does not receive but only transmits telemetry data, and ***a second GPS device 350 which does the reverse, it should be obvious that the second GPS device 350 can be modified to transmit as well as to receive telemetry data, and that more than one of these modified second GPS 350 type devices can be used. This enables the users of a system of two second GPS type devices 350 to simultaneously move toward each other as depicted in FIG. 10***."
>
> (*See* Norris, col. 7, lines 56-65, *emphasis added*)

245. A PHOSITA would understand that telemetry, as described above in relation to a radio signal, would be a wireless connection, and both GPS devices 340 and 350 would be thus connected by a wireless link.

e. a display

246. This element is common with Claim 1, See Claim 1 analysis.

f. **wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation.**

247. This element is common with Claim 1, See Claim 1 analysis.

v. Claim 15

a. **A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow**

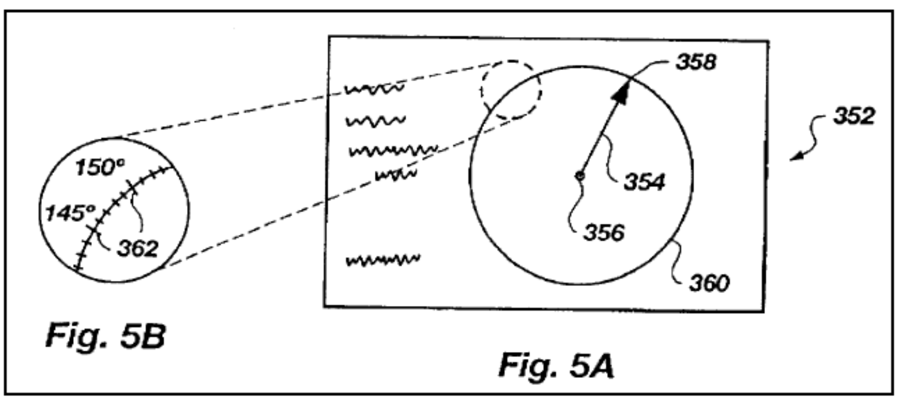
248. Claim 15 depends from Claim 1, and adds the further limitations "A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow".

249. As described above, Norris Anticipates Claim 1.

250. Norris discloses that the direction from the current location ("present place") and the other GPS device (Inputted destination) is denoted by an arrow oriented in the direction of the destination. Under the broadest reasonable interpretation, this arrow comprises the route from the present location to the destination. For example:

> "The interface 352 consists of ***an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device*** 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)

251. The "arrow" oriented to point in the direction of the destination is also illustrated as item 354 in Figures 5A, and, reproduced below.



Norris FIG. 5A; FIG. 5B.

252. By way of a practical application wherein the route is the path to a golf hole on a golf course, the destination location would be retrieved from the transmitting GPS device by the receiving device.

253. Norris describes that the arrow will guide the user to a hidden golf hole, thereby providing them with a "route", indicated by an arrow.

> "Variations on the preferred embodiment are possible depending upon the particular application of the present invention. A particular example of ***an application for which the present invention is particularly suited is for a golf course***. A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is playing. I***f the golf hole 510 is obscured by a hill or foliage 540. the golfer 550 will always know the precise distance and direction to aim***, and consequently will be better able to choose a club."
>
> (*See* Norris, col. 9, lines 51-63, *emphasis added*)

254. A PHOSITA would understand that this arrow represents the route from the current location to the destination because if the user follows that direction, they will reach the destination (in this case with their golf ball).

vi. Claim 16

a. A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route

255. Claim 16 depends from Claim 15, which depends from Claim 1, and adds the further limitation "A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route".

256. As described above, Norris Anticipates Claim 1 and Claim 15.

257. As described elsewhere in this report, in my opinion Claim 16 is invalid for indefiniteness and lack of written description of the claimed "grid information".

However, to the extent that it is determined that "said grid information" is coordinate grid information, then Norris describes this. Norris discloses a graphical means for indicating the distance to the other terminal (destination). In this case, the display is configured with concentric rings indicating increments of distance from the current location 372, which is indicated at the center of the rings, and the other terminal 378.

> FlG. 6 illustrates an alternative embodiment of the graphical screen display of FlGS. SA and SD. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user at a cost to the user of more circuitry and sophistication of the GPS devices. ***More intuitively useful information is displayed on the interface 3S2 by replacing the direction arrows 354 or 370 with a grid***. Centered on the location of the user or second GPS device 3SO. represented by some type of mark 372. are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. Finally. some type of mark 378 such as a small circle. square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked.
>
> (*See* Norris, col. 8, lines 7-21, *emphasis added*)

258. This is illustrated in Figure 6, reproduced below. As can be appreciated in the figure, the concentric rings represent the radial distance coordinates of a polar coordinate grid.

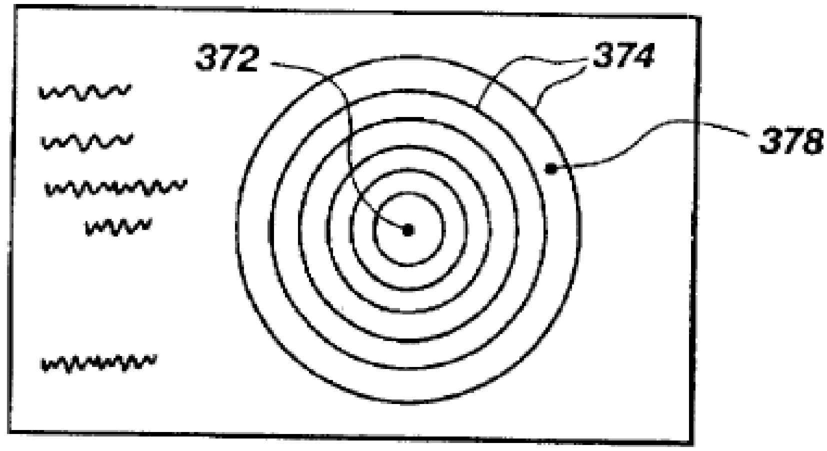
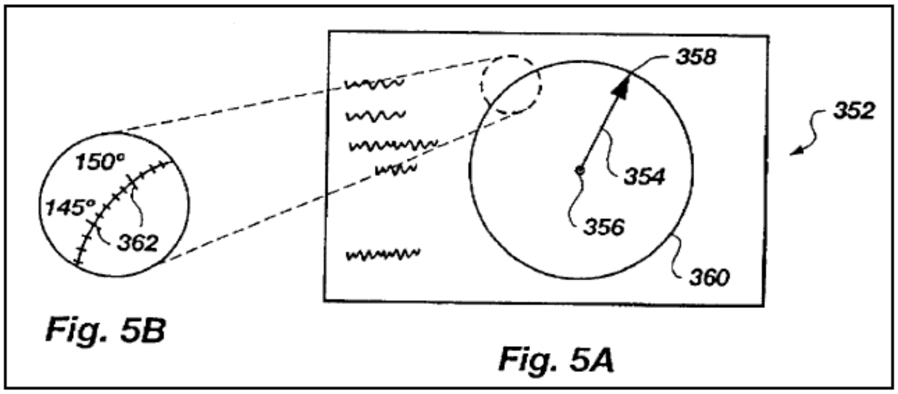


Fig. 6

Norris Fig. 6

259. Norris also describes that the outer ring of the displayed circle includes tick marks representing to directional coordinates (i.e. degrees of angle) of the polar coordinate grid. For example:

> "The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, ***the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."***
>
> (*See* Norris, col. 7, lines 7-12, *emphasis added*)



Norris Figs. 5B and 5B

E. Claims 1-3, 10, and 15-16 of the ’317 Patent are rendered obvious by Norris in combination with Lauro

260. In my opinion Norris in combination with Lauro renders obvious Claims 1-3, 10, and 15-16 of the ‘317 patent.

261. In the sections below I have laid out the basis for my opinion for the various claim elements.

i. Claim 1

a. A portable terminal, comprising

262. Norris discloses a portable terminal. For example, Figure 4, reproduced below indicates two terminals 340 and 350 which are shown as being held by two pedestrian users.

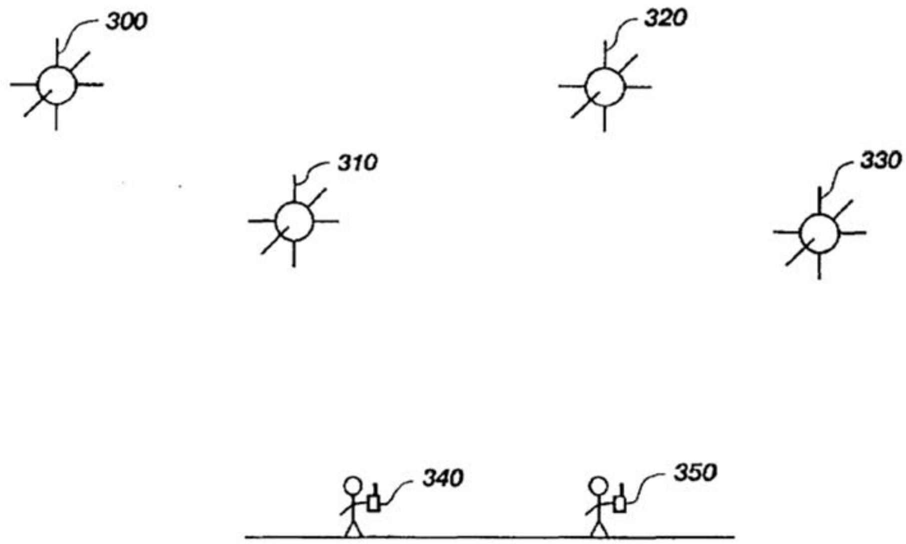
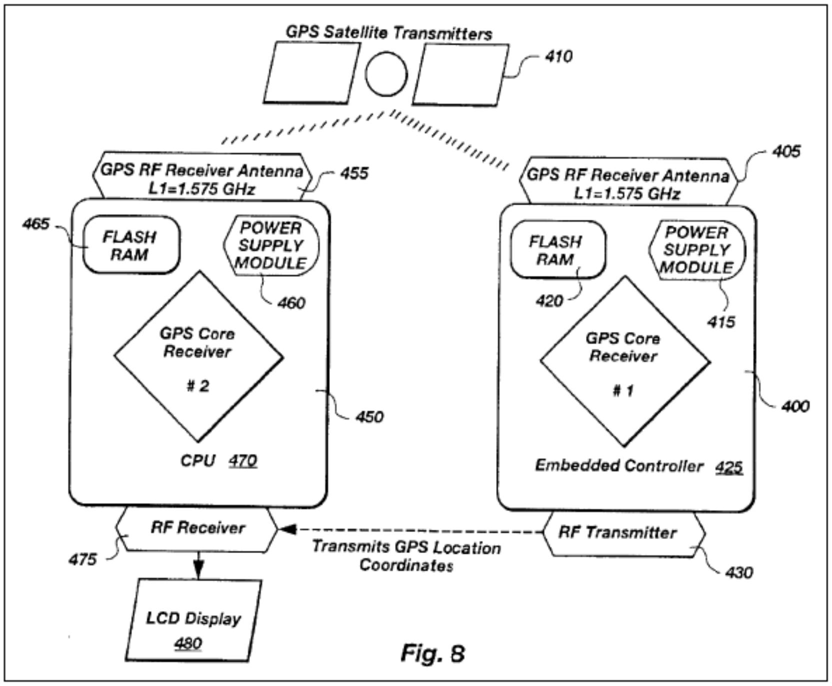


Fig. 4

Norris Figure 4 (showing portable terminals)

263. These devices are illustrated in greater detail in Figure 8 of Norris, reproduced below. Norris states:

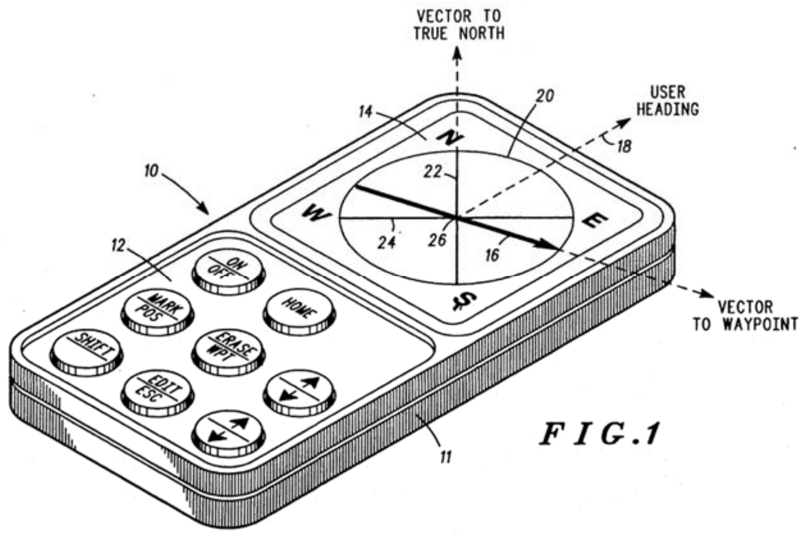
> FIG. 8 illustrates in block diagram form the basic components which are used in a preferred embodiment of the GPS devices 340. 350 receivers of the present invention.'
>
> (*See* Norris, col. 9, lines 24-26)



Norris Fig. 8

264. Lauro describes a portable device that provides a compass-like capability, except, like Norris, the arrow on the device points to a selected destination instead of simply pointing north.

265. Figure 1 of Lauro, reproduced below, shows that this is a small handheld device with a display providing an arrow pointing to a waypoint (interim and final destination), and a keypad for entry of information.



Lauro FIG. 1

266. Lauro describes this device as:

> "An electronic direction finder (10) includes a navigation receiver (28) and a compass (32) to generate a bearing signal that indicates that direction of a desired destination. The bearing signal is received by a display driver (34) which causes an electronic display (14) to generate a visible image of a rotatable pointer that points in the direction of the user's desired destination. Preferably, the display also shows an electronic compass card indicating the direction of north."
>
> (*See* Lauro at Abstract)

b. a device for getting location information denoting a resent[sic] place of said portable terminal

267. Norris discloses a device for getting location information denoting a present place of said portable terminal. For example, Figure 4, reproduced below, illustrates the portable terminals 340 and 350 together with GPS satellites 300 to 330.

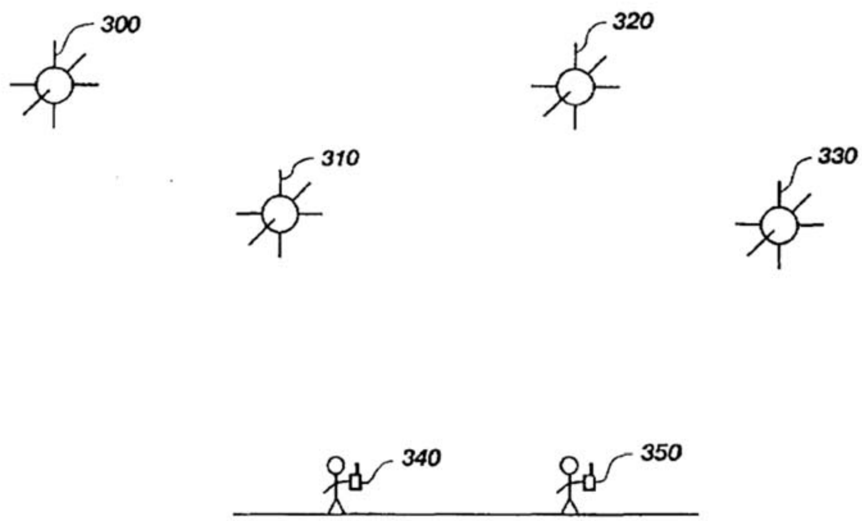


Fig. 4

Norris FIG. 4.

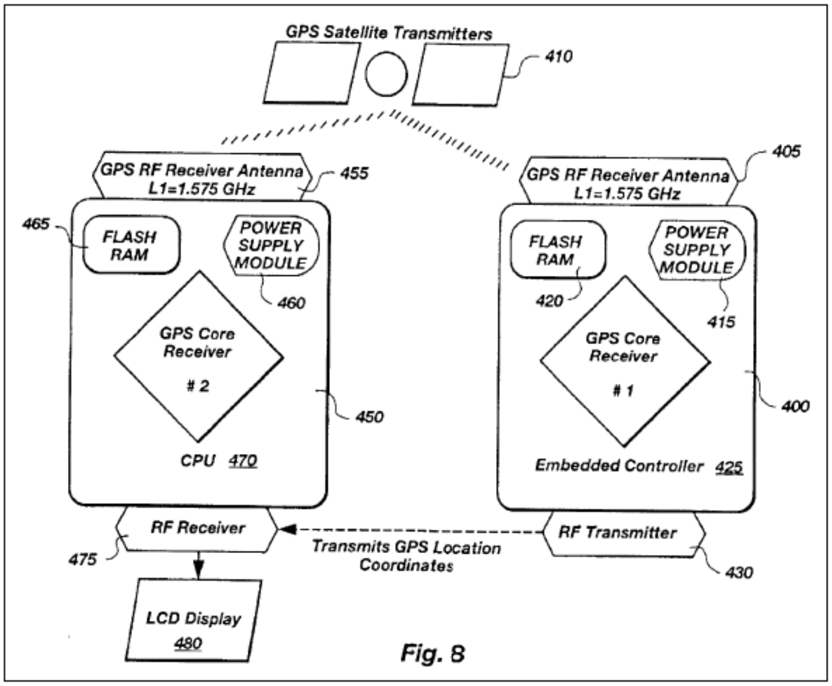
268. Norris describes that the portable devices are able to determine their respective positions. For example:

> "The first and second GPS devices are ***capable of determining their location in terms of longitude and latitude*** according to the methods well known to those skilled in the art through triangulation (location) and quadrangulation (location and elevation) formulas. The innovation of the present invention begins with the first GPS device 340 being modified to be a transceiver so as to transmit this location or location and elevation as telemetry data. Another point of novelty is that the second GPS device 350 is modified not only to receive GPS signals, but also to receive this telemetry data from the first GPS receiver."
>
> (*See* Norris, col. 6, lines 38-48, *emphasis added*)

269. Norris also provides a detailed figure showing the internal components of portable devices 340 and 350. For example:

> "FIG. 8 illustrates in block diagram form the basic components which are used in a preferred embodiment of the GPS devices 340, 350 receivers of the present invention. ***A first GPS device 400 comprises an RF receiving antenna 405 tuned to the GPS satellite broadcasting frequency of 1.575 GHz for receiving clock signals from the GPS Satellite transmitters 410 in orbit***. The first GPS device 400 contains a power supply module 415 and flash RAM 420 for storing computations. ***The GPS triangulation or quadrangulation calculations are made by an internal embedded controller 425 or microprocessor which uses GPS signals to calculate its location in terms of longitude and latitude***. This location is transmitted by means of an RF transmitter 430 to a second GPS device 450. ***This second GPS device 450 is similar to the first GPS device 400 in that the second device 450 also receives GPS satellite signals through an antenna 455, and contains a power supply 460 and flash RAM 465.*** However, the second GPS device 450 has a CPU 470 capable of handling more diverse tasks than the embedded controller 425 of the first GPS device 400. In addition, the second device 450 has an RF receiver 475 for receiving the transmitted location of the first GPS device 400."
>
> (*See* Norris, col. 9, lines 24-45, *emphasis added*)

270. Figure 8 is reproduced below.



Norris FIG. 8.

271. Lauro describes that the device includes a GPS receiver for obtaining the current location of the device. For example:

> Inside the direction finder 10 is a ***navigation receiver***, a compass and other circuits (discussed more fully below) that enable the direction finder to point the user toward "home" or toward another desired destination.
>
> (*See* Lauro, col. 1, lines 62-64)

> Referring now to the ***navigation receiver 28, it is preferably a GPS receiver*** which may be of conventional construction. Alternately, a loran receiver or other form of navigation receiver may be used. The ***preferred GPS receiver has a signal processing section that includes an RF front end 36 driving a down converter 38, the latter also receiving a reference frequency signal from an oscillator 37. The output from the down converter 38 is applied to an A/D (analog-to-digital) converter 40 and thence to a DSP (digital signal processor) 42***

> ***to provide an output signal indicative of the user's latitude and longitude***."
>
> (*See* Lauro col. 3, lines 3-14, *emphasis added*)

272. This GPS receiver is also illustrated in Figure 1 of Lauro, reproduced below.

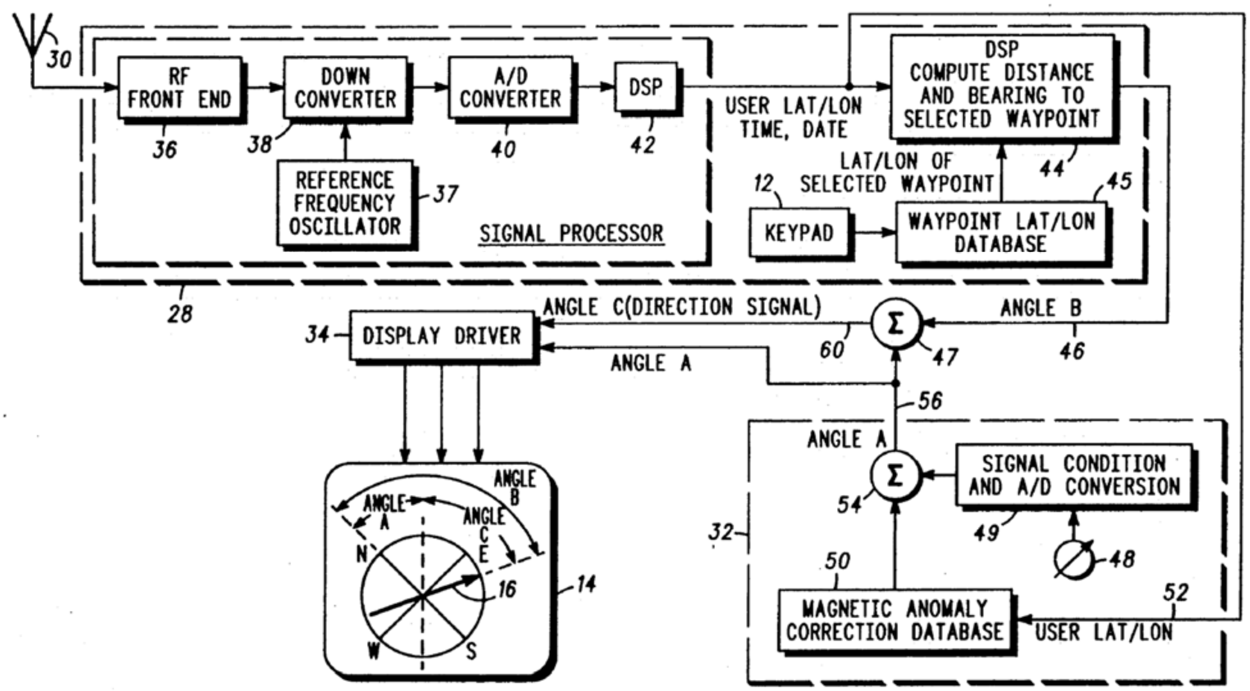


FIG.2

Lauro FIG.2

c. a device for getting direction information denoting an orientation of said portable terminal

273. Norris discloses a device for getting a direction information denoting an orientation of said portable terminal. Specifically, Norris describes that each GPS device includes an internal compass. For example:

.

> "This ability is crucial because the ***orientation of the second GPS device 350 relative to a compass may be changing constantly.*** Therefore, the present invention envisions that a user will be able to hold the second GPS device 350 and turn in a circle, and the arrow 354 will always point toward the first GPS device 340. This implies that the circle 360, if shown, also remains fixed relative to the compass. This ability is a result of an internal compass of the second GPS device 350. ***The internal compass provides a fixed reference point relative to which the continuously displayed arrow 354 will use to always point toward the first GPS device 340***."
>
> (*See* Norris, col. 7, lines 18-29, *emphasis added*)

274. Lauro discloses a device for getting a direction information denoting an orientation of said portable terminal. Specifically, Lauro describes that each GPS device includes an internal compass. For example:

275.

> "The electronic circuitry which provides the information for effecting the functions of the compass card and the pointer will now be described with reference to FIG. 2. As shown, the major components of the direction finder are the display 14, a navigation receiver 28 coupled to a receiving antenna 30, ***a compass 321*** and a display driver 34. ***Generally speaking, the navigation receiver 28 and the compass 32*** generate signals that are combined so as to generate a "direction signal". This direction signal is indicative of a bearing toward a desired destination of the user, and the bearing is relative to the user's heading.
>
> (*See* Lauro, col. 2, lines 54-67, *emphasis added*)

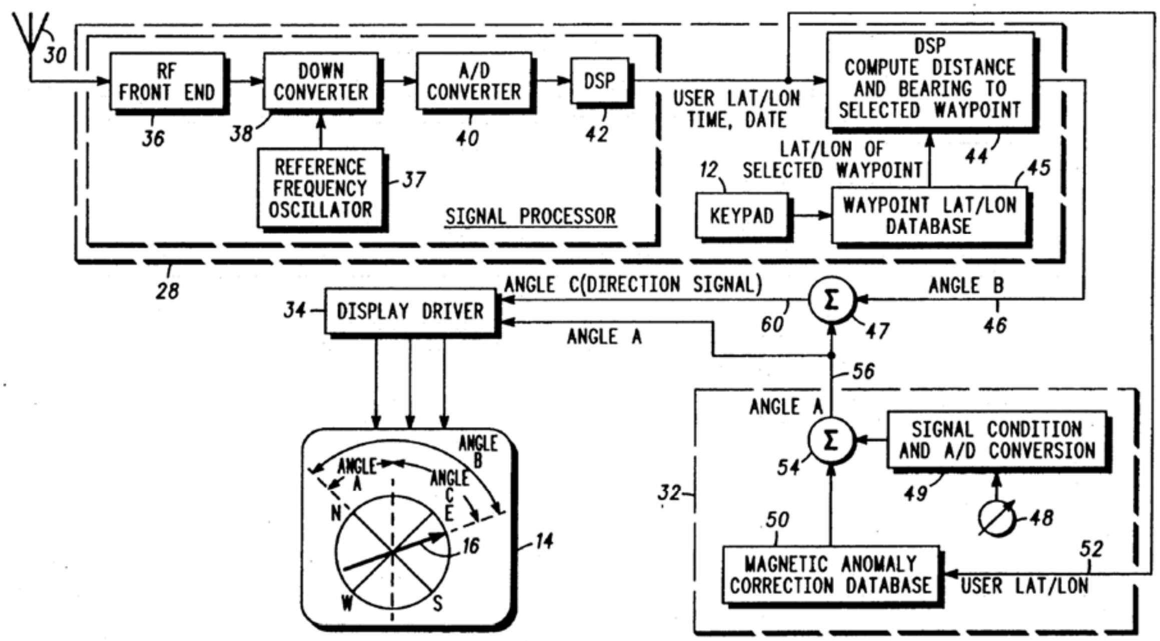


FIG.2

Lauro FIG.2

276. Lauro further describes that the compass is a conventional flux gate device.

For example:

> Preferably, the ***compass 32 is a flux gate compass*** whose components may all be conventional. The illustrated compass includes a ***conventional flux gate mechanism 48 whose output may be applied to a conventional signal conditioning and AID (analog-to-digital) conversion circuit 49. The output of the circuit 49 is a signal that represents the user's heading relative to magnetic north***."
>
> (*See* Lauro, col. 3, lines 33-40, *emphasis added*)

d. an input device for inputting a destination

277. Norris discloses a tuner device for inputting a destination. Specifically, Norris describes that the user may use the tuner to select a frequency so that the

radio receiver in the device will receive signals transmitted by a specific device. This device may be another mobile terminal, for example one that the user is seeking to reach, or it may be a fixed location, such as a golf hole. For example:

> "The system would further ***include the ability of the second GPS device to tune*** to a signal broadcast by different GPS transceiver devices. By ***selectively tuning to the signal of a desired GPS device,*** a distance of. direction to and elevation variance of a plurality of different GPS devices is possible."
>
> (*See* Norris, col. 3, line 65 to col. 4, line 2, *emphasis added*)

> "A further modification is that ***the second GPS device 350 is advantageously and selectively tuneable to receive telemetry from a desired frequency***. This enables the second GPS device 350 to be be [sic] able to track multiple GPS devices. It is also ***possible to provide a tuner*** such that a plurality of GPS devices can be simultaneously tracked and displayed on the second GPS device 350 interface. These features also imply that the first GPS device 340 can advantageously selectively transmit telemetry on a desired frequency."
>
> (*See* Norris, col. 6, lines 49-57, *emphasis added*)

> "A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. **A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole** on which the golfer is playing."
>
> (*See* Norris, col. 9, lines 55-60, *emphasis added*)

> "Furthermore, not only would ***selective tuning*** to receive different GPS signals be possible, but GPS receivers could also selectively transmit on desired frequencies

> (*See* Norris, col. 10, lines 2-4)
>
> "The relative position indicating system of claim 9 wherein the at least another ***one of the plurality of GPS devices further comprises means for selectively tuning said receiving means to receive a desired telemetry frequency***."
>
> (*See* Norris Claim 10, *emphasis added*)
>
> "While the preferred embodiment has discussed a first GPS device 350 which does not receive but only transmits telemetry data, and a second GPS device 350 which does the reverse, it should be obvious that the second GPS device 350 can be modified to transmit as well as to receive telemetry data, and that more than one of these modified second GPS 350 type devices can be used. ***This enables the users of a system of two second GPS type devices 350 to simultaneously move toward each other as depicted in FIG. 10***."
>
> (*See* Norris, col. 7, lines 56-65, *emphasis added*)

278. Lauro describes a keyboard that is used to input destination information. This destination information is converted using database 45 into latitude and longitude coordinates. For example:

> "Another conventional DSP 44 receives two inputs, one from the DSP 42 ***and a second input from a database 45 that contains the latitudes and longitudes of various waypoints, as input by the user via the keypad 12.*** Operating conventionally, the DSP 44 uses those inputs to compute the distance and bearing to the waypoint selected by the user."
>
> (*See* Lauro, col. 3, lines 18-22, *emphasis added*)

279. A PHOSITA would have found it obvious to use the keypad input of Lauro together with Lauro's database to allow the user to enter destination information

and thereby automatically tune the receiver of Norris to a frequency associated (in the database) with that destination. In such a combination, each device would be performing the same functions as it was in its original application, and the combination would yield the predictable result of tuning the receiver of Norris to the frequency associated with a particular destination based on an input by the user, using Lauro's keypad and database. This combined system would have the advantage of avoiding the need for the user to recall the various frequencies associated with the destinations (e.g. golf holes), and thus would make the device easier to use.

e. "a display"

280. Norris discloses a display. For example:

> "Finally, the second GPS device 450 advantageously has an ***LCD interface 480*** for indicating to the user the relative position of device 400 relative to the second GPS device 450."
>
> (*See* Norris, col. 9, lines 45-48, *emphasis added*)

> "Specifically, the interface 352 of the second GPS receiver is shown in FIG. 5A and is comprised of ***an LCD screen 352***, such as the type used in portable notebook computers but smaller. The interface 352 consists of an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on

> the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."
>
> (*See* Norris, col. 6, line 66 to col.7, line 12, *emphasis added*, *see also* Norris Figure 8, *Id.*)

281. Lauro also describes that the device includes a liquid crystal display

> Referring now to ***the display 14, one of its most significant features is that it generates an image of a pointer 16 (preferably in the form of the illustrated arrow) that points toward the desired destination selected by the user, irrespective of the user's heading***.
>
> (*See* Lauro, col. 1, line 65 to col. 2, line 1, *emphasis added*)

> ***The display 14 may be a conventional liquid crystal display***. The specific construction of this type of display, and the construction of the display driver 34, is discussed immediately below with reference to FIG. 3.
>
> (*See* Lauro, col. 4, lines 1-4, *emphasis added*)

f. wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation

282. Norris discloses a display that "displays positions of said destination and said present place to said destination". For example:

> "Finally, the second GPS device 450 advantageously has an LCD interface 480 for ***indicating to the user the relative position of device 400 relative to the second GPS device 450***."

> (*See* Norris, col. 9, lines 45-48, *emphasis added*)

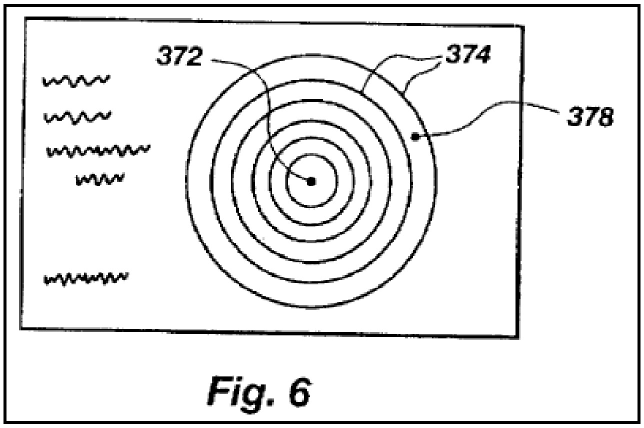
> "After receiving the telemetry transmission of the first GPS device 340, device 350 calculates a relative distance between the GPS receivers 340 and 350 by comparing absolute longitudes and latitudes. ***The interface of the second GPS device 350 then graphically displays the position of the first GPS device 340 relative to the second GPS device 350*** in an intuitive manner which facilitates immediate travel to the first GPS device 340 without consulting a map."

> (*See* Norris, col. 6, lines 58-65, *emphasis added*)

> "FIG. 6 illustrates an alternative embodiment of the graphical screen display of FIGS. 5A and SD [sic]. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user, at a cost to the user of more circuitry and sophistication of the GPS devices. More intuitively useful information is displayed on the interface 352 by replacing the direction arrows 354 or 370 with a grid. Centered on ***the location of the user or second GPS device 350***, represented by some type of mark 372, are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. ***Finally, some type of mark 378 such as a small circle, square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked***."

> (*See* Norris, col. 8, lines 7-21, *emphasis added*)

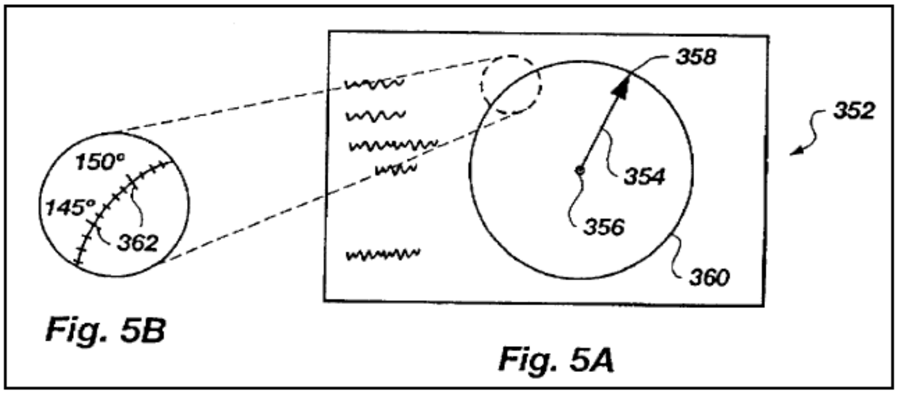
283. This is illustrated by Figure 6, reproduced below.



Norris Figure 6

284. Norris further discloses a display that displays "a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation". For example:

> "The interface 352 consists of an arrow 354, ***an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356***. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)



Norris FIG. 5A, FIG. 5B.

285. Norris describes that as the device is rotated, the displayed arrow will stay pointing at the other GPS device, and thus the display will change, that is the direction of the destination relative to the orientation of the device will change, as the device orientation changes. For example:

> "The feature described above is illustrated. for example. in FIG. 5C. ***For this drawing. the direction north of the fixed compass 368 is toward the top of the paper***. The direction "north" might be true north or magnetic north. ***The two GPS devices illustrated are the same GPS device 366. but shown in two different positions or orientations relative to the fixed 35 compass 368***. What remains constant (as long as the object being tracked does not move) is that the arrow 354 always points due east to some tracked GPS device whose telemetry data has been received by the pictured GPS device 366. Not shown because of the scale of the drawing is the fact that the 40 arrow 354 also points to the same tick mark 362 at approximately 90 degrees. the circle 360 and tick marks 362 also remain fixed relative to the compass 368."
>
> (*See* Norris, col. 7, lines 30-43, *emphasis added*)

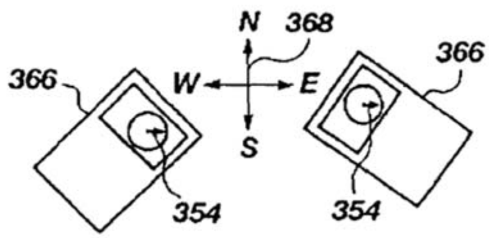


Fig. 5C

Norris Figure 5C

286. Norris discloses a portable terminal for walking navigation. For example, Figure 4, reproduced below indicates two terminals 340 and 350 which are shown as being held by two ***pedestrian (i.e. "walking")*** users.

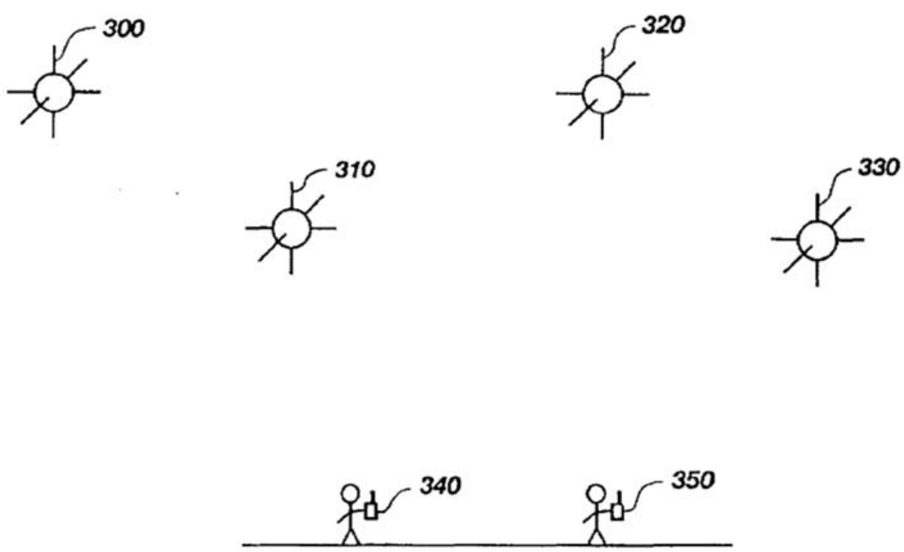


Fig. 4

Norris Figure 4

287. I note that because Norris illustrates the device being used by a user who is walking, it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

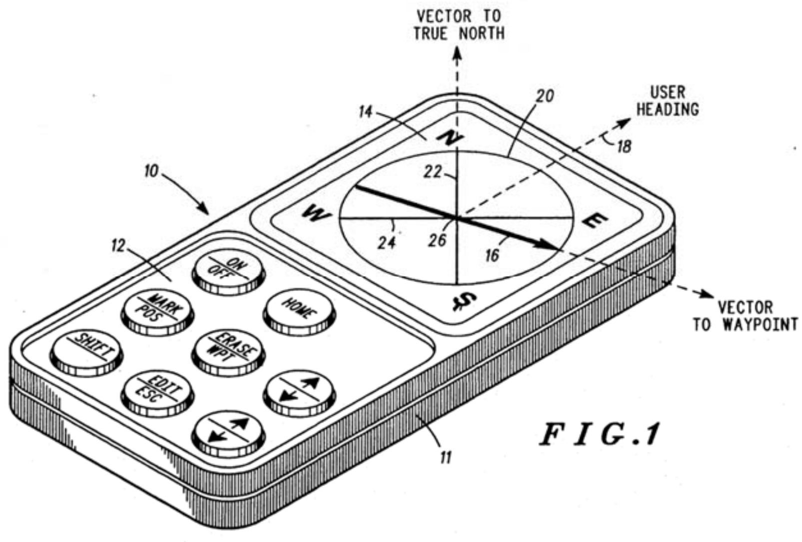
288. Lauro discloses a display that displays "a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation". For example:

> "Herein, the user's heading is considered as parallel to the major axis 18 of the direction finder. ***Thus, with the user facing in the direction of the axis 18, the pointer 16 clearly indicates that the user should turn to his right approximately 75° in order to be headed directly toward the desired destination. As the user turns in that direction, the head of the pointer 16 automatically moves in a counterclockwise direction. When the user is facing directly toward the desired destination, the pointer 16 will point directly along the axis 18.*** An advantage of this "pointing" system is that the user does not need to be familiar with compass or navigation terminology to determine the direct route toward the desired destination."
>
> (*See* Lauro, col. 2, lines 1-15, *emphasis added*)

> "The electronic circuitry which provides the information for effecting the functions of the compass card and the pointer will now be described with reference to FIG. 2. As shown, the major components of the direction finder are the display 14, a navigation receiver 28 coupled to a receiving antenna 30, a compass 321 and a display driver 34. ***Generally speaking, the***

> ***navigation receiver 28 and the compass 32 generate signals that are combined so as to generate a "direction signal". This direction signal is indicative of a bearing toward a desired destination of the user, and the bearing is relative to the user's heading. The "direction signal" is applied to the display driver 34 which causes the display 14 to generate the image of the rotatable pointer 16 and to cause the pointer to point in the direction of the desired destination***."
>
> (*See* Lauro, col. 2, line 54 to col. 3, line 2, *emphasis added*)
>
> To develop a signal which represents the direction of the desired destination relative to the user's heading, ***Angle A on lead 56 is combined with Angle B on lead 46 in the combining circuit 47 such that Angle A is subtracted from Angle B to produce Angle C on lead 60. The signal representing Angle C is the "direction signal" that causes the. pointer 16 to point in the direction of the user's desired destination, irrespective of the user's heading***."
>
> (*See* Lauro, col. 3, lines 55-63, *emphasis added*)

289. Figure 1 of Lauro, reproduced below, shows that this is a small handheld device. A POSTA would understand that this device is intended to be used by users holding the device in their hands, and that this would preclude other activities such as driving or steering a vehicle. Thus, a PHOSITA would understand that the intended use of the Lauro device would be by a user who is walking or otherwise engaged in pedestrian transport.



Lauro FIG. 1

290. I note that because Lauro illustrates the device being used by a user who is walking, and this device would be, at best, unwieldy to use while driving, it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

ii. Claim 2

a. A portable terminal according to claim 1, wherein said direction from said present place to said inputted destination is denoted with an orientation of line

291. Claim 2 depends from Claim 1 and adds the further limitation "wherein said direction from said present place to said inputted destination is denoted with an orientation of line".

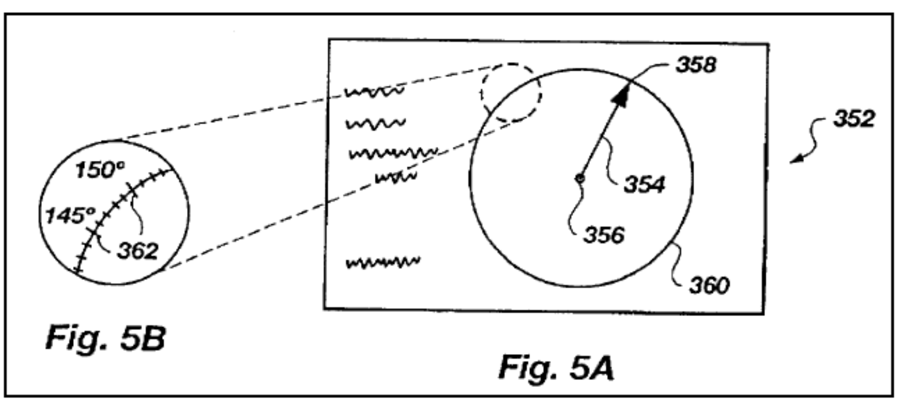
292. As described above, Norris in combination with Lauro renders Claim 1 obvious.

293.

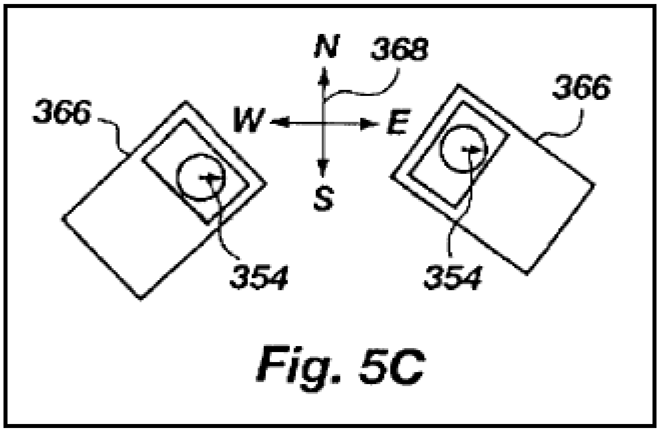
294. Norris discloses that the direction from the current location ("present place") and the other GPS device (Inputted destination) is denoted by a line oriented in the direction of the destination. For example:

> "The interface 352 consists of ***an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device*** 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)

295. The "line" oriented to point in the direction of the destination is also illustrated as item 354 in Figures 5A, and 5C, reproduced below.



Norris FIG. 5A; FIG. 5B.



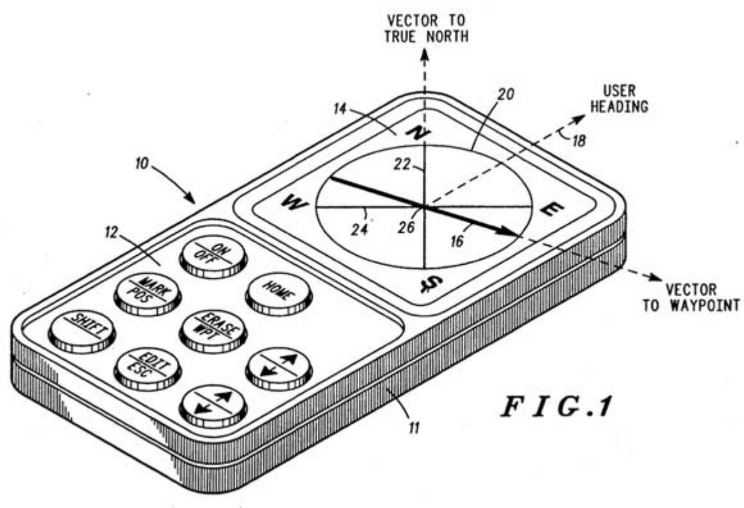
Norris FIG. 5C

> "The feature described above is illustrated, for example, in FIG. 5C. For this drawing, the direction north of the fixed compass 368 is toward the top of the paper. The direction "north" might be true north or magnetic north. The two GPS devices illustrated are the same GPS device 366, but shown in two different positions or orientations relative to the fixed compass 368. What remains constant (as long as the object being tracked does not move) is that ***the arrow 354 always points due east to some tracked GPS device whose telemetry data has been received by the pictured GPS device 366***. Not shown because of the scale of the drawing is the fact that the arrow 354 also points to the same tick mark 362 at approximately 90 degrees, the circle 360 and tick marks 362 also remain fixed relative to the compass 368."
>
> (*See* Norris, col. 7, lines 21-44, *emphasis added*)

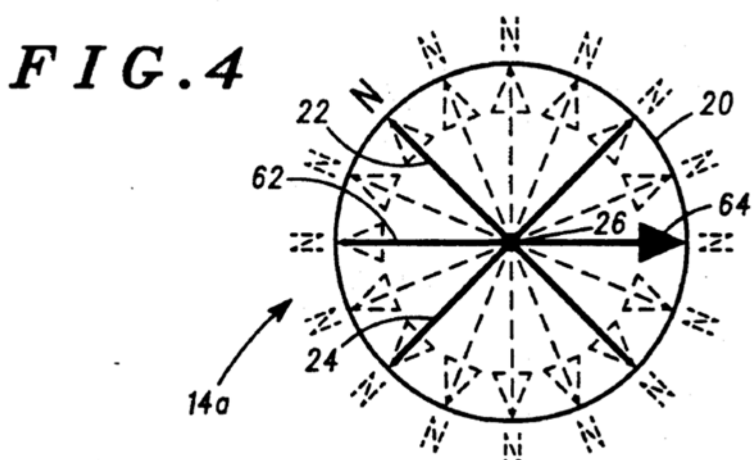
296. Lauro discloses that the direction from the current location ("present place") and the other GPS device (inputted destination) is denoted by a line and an arrow oriented in the direction of the destination. For example:

> At any given time, up to three of the line segments may be activated. One of the activated line segments (e.g. segment 22)

> indicates the north-south direction, another activated line segment (e.g., segment 24) indicates the east-west direction, and the third activated line segment 62 forms part of the pointer. In FIG. 3, all these activated line segments are shown as solid black lines. The unactivated line segments are shown as dashed lines.
>
> (*See* Lauro, col. 4, lines 24-32)



Lauro FIG. 1



Lauro Fig 4

iii. Claim 3

a. A portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number

297. Claim 3 depends from Claim 1 and adds the further limitation "wherein a distance between said present place and said destination is denoted with a number".

298. As described above, Norris in combination with Lauro renders Claim 1 obvious.

299. Norris discloses that the distance to the other device (Destination) may be indicated in several ways. First, Norris discloses that indicating the distance to a destination was well-known in the art, and thus would have been obvious to a PHOSITA. For example, Norris discloses that the prior art included a "distance indicator".

> A ***distance indicator 75 also shows a relative distance to the transmitter 10*** by indicating the strength of the signal received. (*See* Norris, col. 5, lines 7-9, *emphasis added*)

300. This distance indicator is shown in Figure 1, reproduced below.

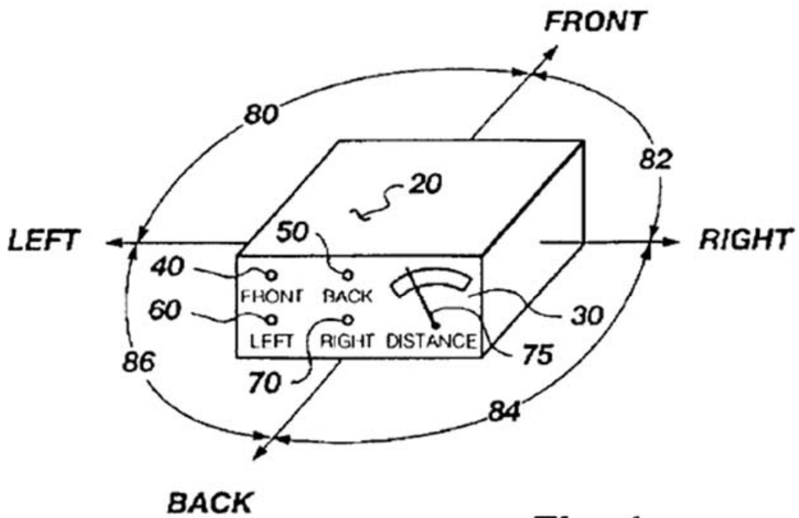


Fig. 1
(PRIOR ART)

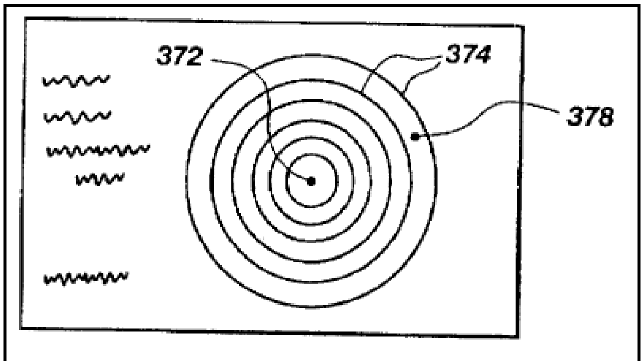
Norris Fig. 1

301. Norris also describes that the distance to the other device (destination) may be indicated in text on the display. For example:

> ***Distance, as well as other useful but presently nongraphically displayed information is displayed as text in an unused portion of the LCD screen 352***. This information includes but is not limited to the selected telemetry frequency or frequencies of remote first GPS devices 340. It is also possible to choose a units of distance for the displayed distance measurement shown as text so as to conform to user preferences for the U.S. or metric system.
>
> (*See* Norris, col. 7, lines 48-55, *emphasis added*)

302. Norris also discloses a graphical means for indicating the distance to the other terminal (destination). In this case, the display is configured with concentric rings indicating increments of distance from the current location 372, which is

indicated at the center of the rings, and the other terminal 378. This is illustrated in Figure 6, reproduced below.



Norris Fig. 6

303. Norris also describes this display. For example:

> FIG. 6 illustrates an alternative embodiment of the graphical screen display of FIGS. 5A and SD [sic]. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user, at a cost to the user of more circuitry and sophistication of the GPS devices. More intuitively useful information is displayed on the interface 352 by replacing the direction arrows 354 or 370 with a grid. Centered on ***the location of the user or second GPS device 350***, represented by some type of mark 372, are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. ***Finally, some type of mark 378 such as a small circle, square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked***.
>
> (*See* Norris, col. 8, lines 7-21, *emphasis added*)

304. Norris also describes a distance and elevation display wherein the location of the other terminal (destination) can be shown in distance and vertical elevation. For example, as shown in Figures 7A and 7B reproduced below.

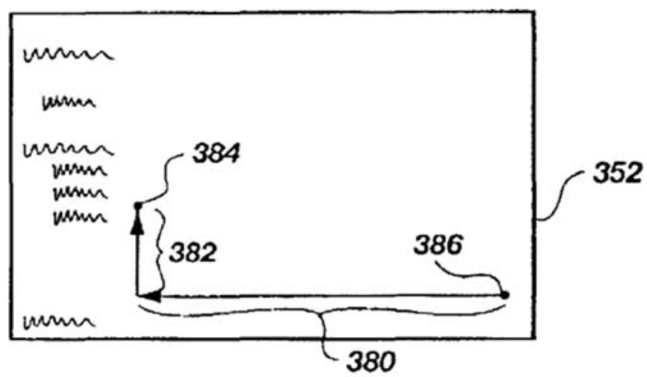


Fig. 7A

Norris Fig 7a

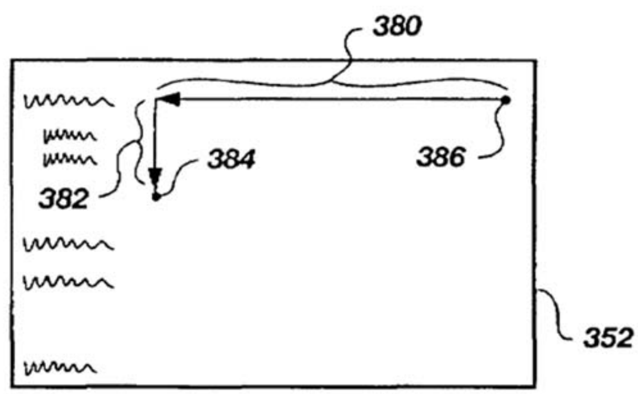


Fig. 7B

Norris Fig 7b,

305. Norris describes this display:

> Therefore, graphical display of elevation relative to distance is provided by toggling between a screen providing graphical

> direction information (FIG. 5A) or graphical direction and distance information (FIG. 6) to a screen as shown in FIGS. 7 A or 7B. ***This screen 352 displays the horizontal distance to travel 380 on the horizontal axis 380. and an elevation variance 382 when on a meaningful scale.***
>
> (*See* Norris, col. 9, lines 1-7, *emphasis added*)

306. Norris also provides a typical application of the invention which includes knowing the distance and direction to a golf hole that is not visible from the current location.

> Variations on the preferred embodiment are possible depending upon the particular application of the present invention. A particular example of ***an application for which the present invention is particularly suited is for a golf course***. A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is playing. I***f the golf hole 510 is obscured by a hill or foliage 540. the golfer 550 will always know the precise distance and direction to aim***. and consequently, will be better able to choose a club.”]
>
> (*See* Norris, col. 9, lines 51-63, *emphasis added*)

307. Lauro describes that the device is intended to be used to provide destination distance and direction information to a user. For example:

> This invention is directed generally to the field of electronic direction finders which ***provide a user with information as to the distance and bearing from the user's present position to a desired destination.***

> (*See* Lauro, col. 1, lines 5-8, *emphasis added*)

308. Lauro also notes that the device could be modified to explicitly include distance information in text on the display. For example:

> As an option, the images of the compass card and the pointer may be selectively erased from the display at the user's election, and replaced by ***numerical information indicating the user's present latitude and longitude, the range and bearing of the desired destination, etc. The same numerical information could also be displayed in a portion of the display 14 that is not occupied by images of the compass card and pointer***.
>
> (*See* Lauro, col. 2, lines 46-53, *emphasis added*)

iv. Claim 10

309. Claim 10 is an independent claim.

a. A portable terminal, comprising:

310. This element is common with Claim 1. As described above, Norris in combination with Lauro renders Claim 1 obvious. See Claim 1 analysis.

b. a device for getting location information denoting a present place of said portable terminal;

311. This element is common with Claim 1. As described above, Norris in combination with Lauro renders Claim 1 obvious. See Claim 1 analysis.

c. a device for getting direction information denoting an orientation of said portable terminal;

312. This element is common with Claim 1. As described above, Norris in combination with Lauro renders Claim 1 obvious. See Claim 1 analysis.

d. a device for getting a location information of another portable terminal from said another terminal via connected network;

313. Norris discloses a device for getting a location information of another portable terminal from said another terminal via connected network. Specifically, Norris discloses a radio receiver that us tuned to the transmission frequency of the other terminal, so that it can receive broadcast of position from the other terminal. For example:

> "The GPS triangulation or quadrangulation calculations are made by an internal embedded controller 425 or microprocessor which uses GPS signals to calculate its location in terms of longitude and latitude. This location is transmitted by means of an ***RF transmitter 430 to a second GPS device 450***." (*See* Norris, col. 9, lines 32-37)

> "In addition, ***the second device 450 has an RF receiver 475 for receiving the transmitted location of the first GPS device 400***." (*See* Norris, col. 9, lines 43-45)

> "A further modification is that the ***second GPS device 350 is advantageously and selectively tuneable to receive telemetry from a desired frequency. This enables the second GPS device 350 to be able to track multiple GPS devices***. It is also possible to provide a tuner such that a plurality of GPS devices can be simultaneously tracked and displayed on the second GPS device 350 interface. These features also imply that the first GPS device 340 can advantageously selectively transmit telemetry on a desired frequency."
>
> (*See* Norris, col. 6, lines 49-57)

> "Returing now to the system of GPS devices, ***the second GPS device 350 is constantly receiving updated telemetry data from the first GPS device 340*** and from the GPS satellites 300, 310, 320, 330 overhead."
>
> (*See* Norris, col. 7, lines 13-16)

> "While the preferred embodiment has discussed a first GPS device 350 which does not receive but only transmits telemetry data, and ***a second GPS device 350 which does the reverse, it should be obvious that the second GPS device 350 can be modified to transmit as well as to receive telemetry data, and that more than one of these modified second GPS 350 type devices can be used. This enables the users of a system of two second GPS type devices 350 to simultaneously move toward each other as depicted in FIG. 10***."
>
> (*See* Norris, col. 7, lines 56-65)

314. A PHOSITA would understand that telemetry, as described above in relation to a radio signal would be a wireless connection, and both GPS devices 340 and 350 would be thus connected by a wireless link.

e. a display

315. This element is common with Claim 1. As described above, Norris in combination with Lauro renders Claim 1 obvious. See Claim 1 analysis.

f. wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according

to a change of said direction of said portable terminal orientation for walking navigation.

316. This element is common with Claim 1. As described above, Norris in combination with Lauro renders Claim 1 obvious. See Claim 1 analysis.

v. Claim 15

a. A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow

317. Claim 15 depends from claim 1, and adds the further limitation "a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow "

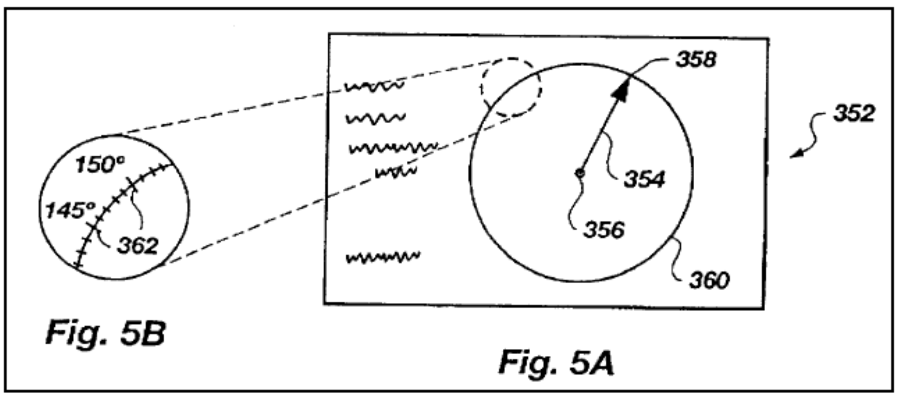
318. As described above, Norris in combination with Lauro renders Claim 1 obvious.

319. Norris discloses that the direction from the current location ("present place") and the other GPS device (Inputted destination) is denoted by an arrow oriented in the direction of the destination. Under the broadest reasonable interpretation, this arrow comprises the route from the present location to the destination. For example:

> The interface 352 consists of ***an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device*** 340. This is accomplished by pivoting or rotating the arrow 354 about the

> fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass.
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)

320. The "arrow" oriented to point in the direction of the destination is also illustrated as item 354 in Figures 5A, and, reproduced below.



Norris FIG. 5A; FIG. 5B.

321. By way of a practical application wherein the route is

322. Norris describes that the arrow will guide the user to a hidden golf hole, thereby providing them with a "route", indicated by an arrow.

> Variations on the preferred embodiment are possible depending upon the particular application of the present invention. A particular example of ***an application for which the present invention is particularly suited is for a golf course***. A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. A golfer would tune a

> GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is playing. I***f the golf hole 510 is obscured by a hill or foliage 540. the golfer 550 will always know the precise distance and direction to aim***. and consequently, will be better able to choose a club.
>
> (*See* Norris, col. 9, lines 51-63, *emphasis added*)

323. Lauro describes that the device includes a database 45 that is used to retrieve latitude and longitude information for waypoints entered by the user. Thus, Lauro describes retrieving route information from the current location to a waypoint (destination)

> Another conventional DSP 44 receives two inputs, one from the DSP 42 and a second input from a database 45 that contains the latitudes and longitudes of 20 various waypoints, as input by the user via the keypad 12. Operating conventionally, the DSP 44 uses those inputs to compute the distance and bearing to the waypoint selected by the user.
>
> (*See* Lauro, col. 3, lines 18-24)

324. Lauro also describes displaying route information and direction of movement using an arrow. For example:

> Herein, the user's heading is considered as parallel to the major axis 18 of the direction finder. ***Thus, with the user facing in the direction of the axis 18, the pointer 16 clearly indicates that the user should turn to his right approximately 75° in order to be headed directly toward the desired destination.*** As the user turns in that direction, the head of the pointer 16 automatically moves in a counterclockwise direction. ***When the user is facing directly toward the desired destination, the pointer 16 will point directly along the axis 18.*** An advantage of this "pointing" system is that

> the user does not need to be familiar with compass or navigation terminology to determine the direct route toward the desired destination.
>
> (*See* Lauro, col. 2, lines 1-15, *emphasis added*)

> The electronic circuitry which provides the information for effecting the functions of the compass card and the pointer will now be described with reference to FIG. 2. As shown, the major components of the direction finder are the display 14, a navigation receiver 28 coupled to a receiving antenna 30, a compass 321 and a display driver 34. Generally speaking, the navigation receiver 28 and the compass 32 generate signals that are combined so as to generate a "direction signal". This direction signal is indicative of a bearing toward a desired destination of the user, and the bearing is relative to the user's heading. ***The "direction signal" is applied to the display driver 34 which causes the display 14 to generate the image of the rotatable pointer 16 and to cause the pointer to point in the direction of the desired destination.***
>
> (*See* Lauro, col. 2, line 54 to col. 3, line 2, *emphasis added*)

> To develop a signal which represents the direction of SS the desired destination relative to the user's heading, Angle A on lead 56 is combined with Angle B on lead 46 in the combining circuit 47 such that Angle A is subtracted from Angle B to produce Angle C on lead 60. The signal representing Angle C is the "direction signal" ***that causes the pointer 16 to point in the direction of the user's desired destination, irrespective of the user's heading***.
>
> (*See* Lauro, col. 3, lines 55-63, *emphasis added*)

vi. Claim 16

a. A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route

325. Claim 16 depends from claim 15, which depends from Claim 1, and adds the further limitation “wherein said display further displays said grid information of said route”.

326. As described in connection with Claim 15, and Claim 1, Norris in combination with Lauro renders these claims obvious.

327. As described elsewhere in this report, in my opinion Claim 16 is invalid for indefiniteness and lack of written description of the claimed “grid information”. However, to the extent that it is determined that “said grid information” is coordinate grid information, then Norris describes this.

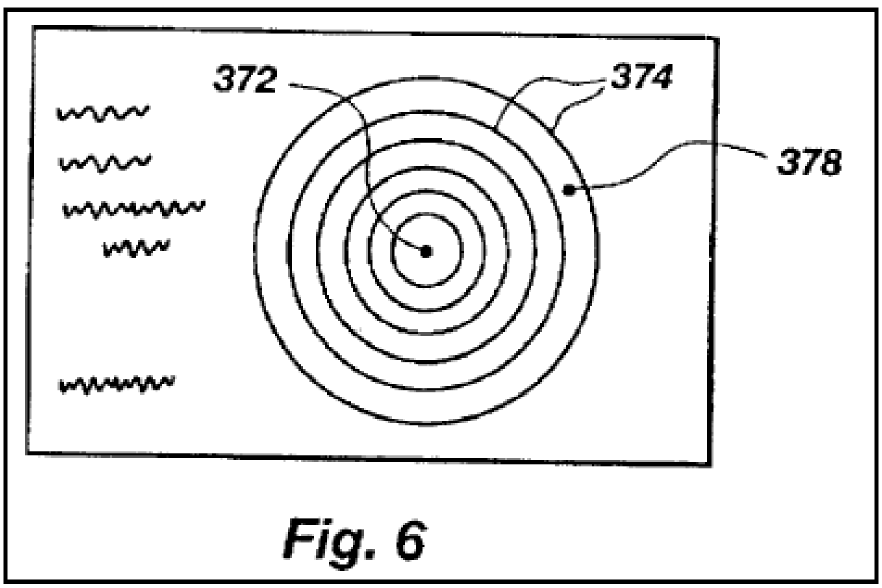
328. Norris discloses a graphical means for indicating the distance to the other terminal (destination). In this case, the display is configured with concentric rings indicating increments of distance from the current location 372, which is indicated at the center of the rings, and the other terminal 378.

329.

> FlG. 6 illustrates an alternative embodiment of the graphical screen display of FlGS. SA and SD. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user at a cost to the user of more circuitry and sophistication of the GPS devices. **More intuitively useful information is displayed on the interface 3S2 by replacing the direction arrows 354 or 370 with a grid**.

> Centered on the location of the user or second GPS device 3SO. represented by some type of mark 372. are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. Finally. some type of mark 378 such as a small circle. square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked.
>
> (*See* Norris, col. 8, lines 7-21)

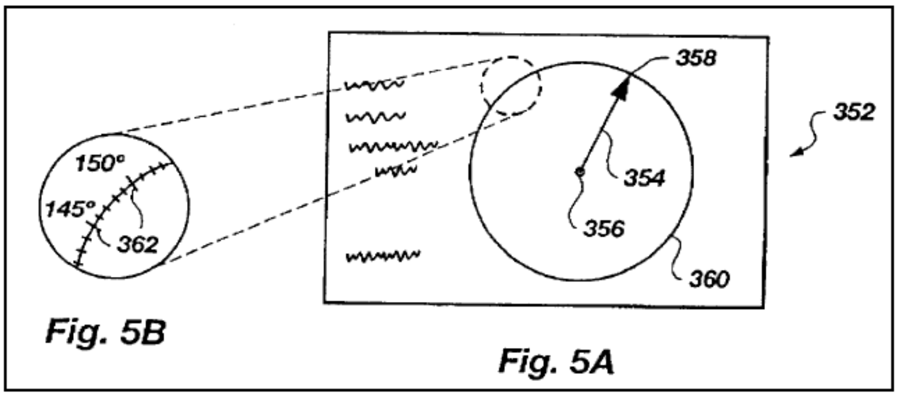
330. This is illustrated in Figure 6, reproduced below. As can be appreciated in the figure, the concentric rings represent the radial distance coordinates of a polar coordinate grid.



Norris Fig. 6

331. Norris also describes that the outer ring of the displayed circle includes tick marks representing to directional coordinates (i.e. degrees of angle) of the polar coordinate grid. For example:

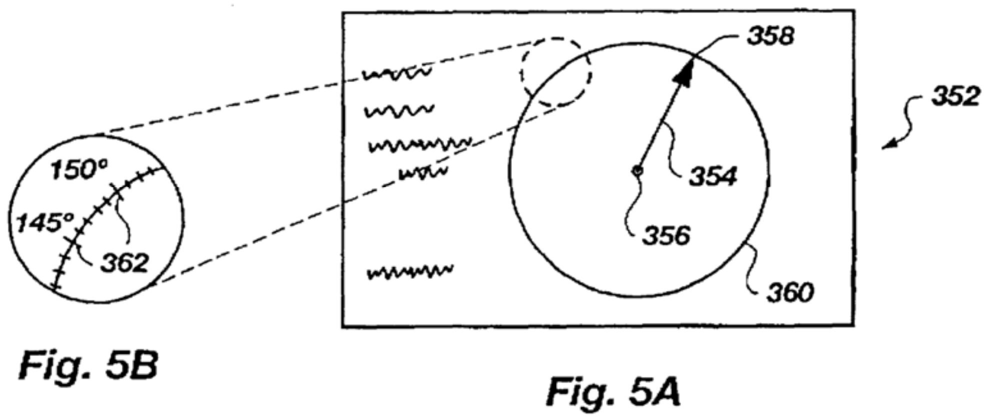
> "The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, ***the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."*** (*See* (*See* Norris, col. 7, lines 7-12)



Norris Figs. 5B and 5B

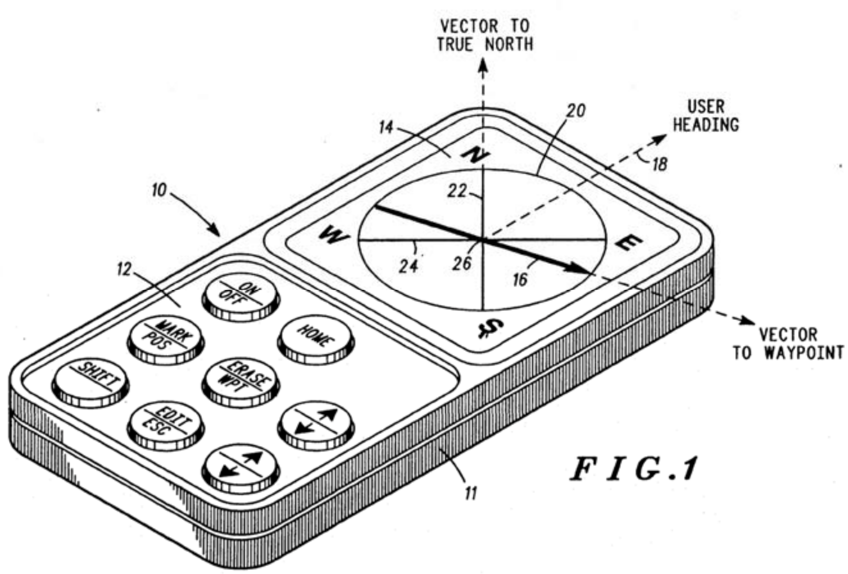
vii. The Combination of Norris and Lauro

332. A PHOSITA would find it obvious to combine the teachings of Norris and Lauro. Both references describe portable devices that provide directional guidance to a destination using a pointer or arrow. Norris describes a handheld device that is tuned to the transmission frequency of another device that transmits its location information over a radio signal. Using this information and the current location of the unit, it then displays the location of the transmitting unit on the display screen together with an indication of the relative direction and distance to that unit. This is illustrated, for example in Figures 5 A and 5b reproduced below.



Norris Figures 5A and 5B

333. Lauro describes a compass-like device wherein, lie Norris, the pointer of the compass points to the desired destination, instead of north as in a conventional compass. This is illustrated, for example, by Figure 1 of Lauro, reproduced below.



Lauro FIG.1

334. Thus, both Norris and Lauro describe direction finding devices that include a displayed pointer or arrow indicating the direction to a destination. As a result, a

skilled artisan implementing the system of Norris would be aware of references such as Lauro, and would seek to use them to improve on the system of Norris.

335. Reading Lauro, a skilled artisan would be motivated to improve the system of Norris by including the keypad and database of Lauro to allow the user of the system of Norris to enter destination information by a common name, instead of tuning the receiver to a pre-set frequency associated with a destination. As noted by Lauro, setting destinations using familiar names instead of number (e.g. latitude and longitude, or radio frequencies) could be desirable when the destinations have known or common names.

> Referring to FIG. l, a portable direction finder 10 is shown whose housing 11 contains a keypad 12 and a display 14. The keypad 12 allows a user to input data regarding the latitude and longitude of the user's present position, and the latitude and longitude of waypoints (also referred to herein as "desired destinations"); the keypad may also permit the user to command the direction finder to point in the direction of a specific desired destination that is commonly referred to as "home.
>
> (*See* Lauro, col. 1, lines 50-59)

336. Norris describes a golf course application wherein the golf holes are assigned to transmit on different frequencies. For example:

> A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. ***A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is***

> ***playing.*** If the golf hole 510 is obscured by a hill or foliage 540. the golfer 550 will always know the precise distance and direction to aim. and consequently, will be better able to choose a club. When a golf hole is completed. ***the golfer tunes a GPS device to the frequency for receiving telemetry data for the next golf hole.*** Advantageously, the present invention works at any golf course for any golf hole, and anywhere on the course because there is no displayed map with boundaries.
>
> (*See* Norris, col. 9, line 55 to col.10, line 1, *emphasis added*)

337. Based on Lauro's teaching of using common names in place of latitude and longitude inputs, a skilled artisan would be motivated to apply this approach to Norris' system, thereby assigning common names (e.g., "Hole 1", Hole 2", etc.) to the golf holes, so that the user would not be required to remember the frequencies associated with any particular hole, and they would not be required to tune the radio. Such an improvement of the Norris system would greatly simplify its utility. Used in this combination each element would each be performing the same function it had been known to perform and would yield no more than one would expect from such an arrangement. The combination would also represent the combination of familiar elements to produce the predictable result of simplified entry of destination information based on names of destinations instead of transmission frequencies.

F. Claims 1-3, 10, 15-17, and 20 of the '317 Patent are rendered obvious by Norris, in combination with Colley

338. In my opinion Norris in combination with Colley renders obvious Claims 1-3, 10, 15-17, and 20 of the '317 patent. In the sections below I have laid out the basis for my opinion for the various claim elements. For brevity, I have combined my analysis for elements that are common across multiple claims.

i. Claim 1

a. A portable terminal, comprising

339. Norris discloses a portable terminal. For example, Figure 4, reproduced below indicates two terminals 340 and 350 which are shown as being held by two pedestrian users.

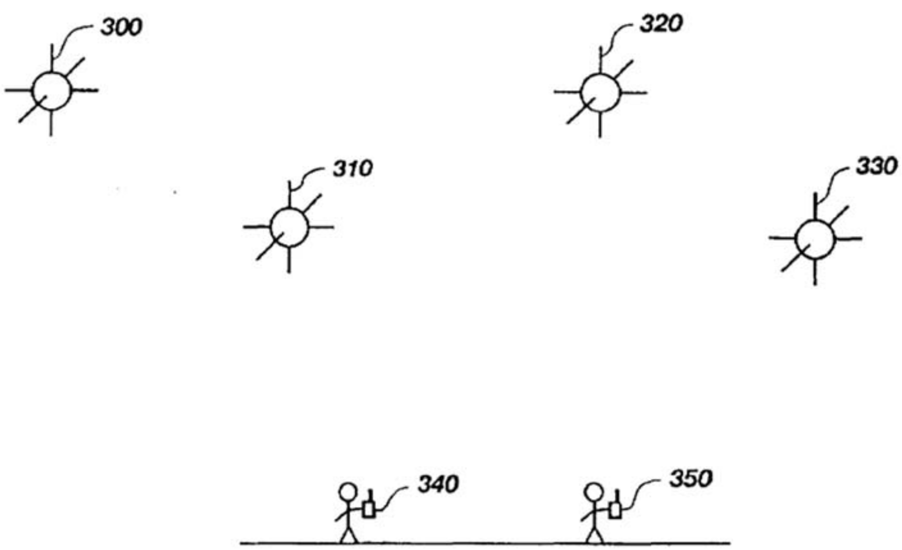
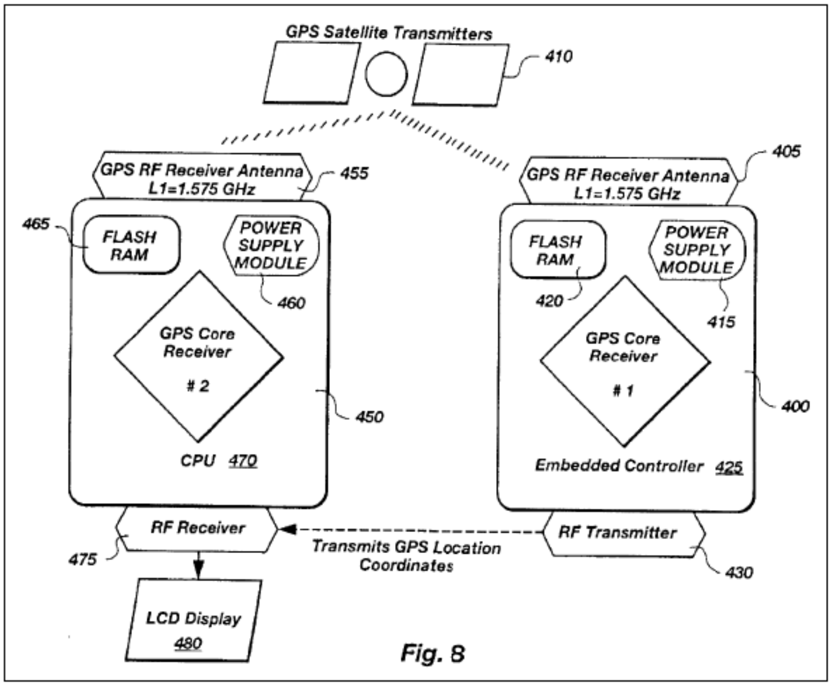


Fig. 4

Norris Figure 4 (showing portable terminals)

340. These devices are illustrated in greater detail in Figure 8 of Norris, reproduced below. Norris states:

> FIG. 8 illustrates in block diagram form the basic components which are used in a preferred embodiment of the GPS devices 340. 350 receivers of the present invention.'
>
> Norris at 9:24-26



Norris Fig. 8

341. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian applications, for example hiking. For example:

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that **embodiments of the invention may be incorporated into almost any type of moving object, system, or simply carried by a person**. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, **hikers or horseback riders** may find it useful to have

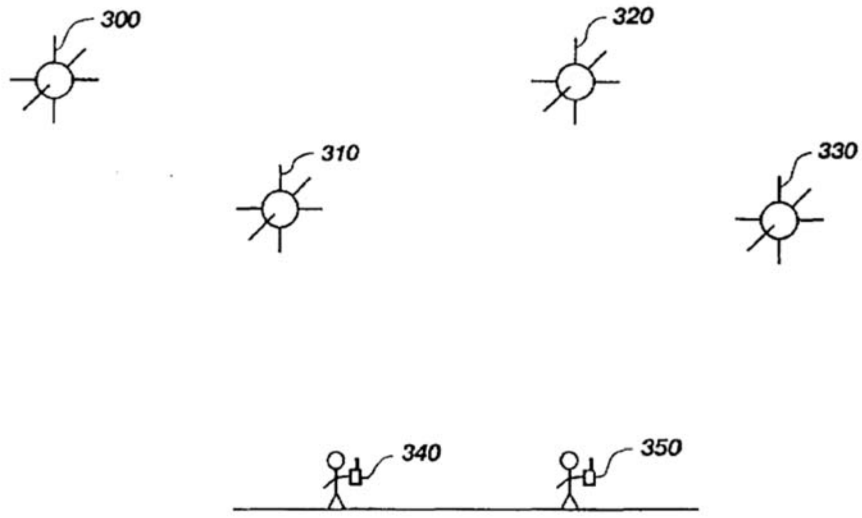
> a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not.
>
> (*See* Colley, col. 5, lines 31-42, *emphasis added*)

342. Colley describes that the device is specifically related to the display of navigational information to guide a user from their current position to ta desired destination. For example:

> The present invention relates to navigation and steering schemes for use in marine, land, and air directional control. More particularly, the present invention relates to the display and expression of position and navigation information in a ***simple and direct format for immediate identification of the user's present location relative to a desired location***.
>
> (*See* Colley, col. 1, lines 7-13, *emphasis added*)

b. a device for getting location information denoting a resent place of said portable terminal

343. Norris discloses a device for getting location information denoting a present place of said portable terminal. For example, Figure 4, reproduced below, illustrates the portable terminals 340 and 350 together with GPS satellites 300 to 330.



Norris FIG. 4.

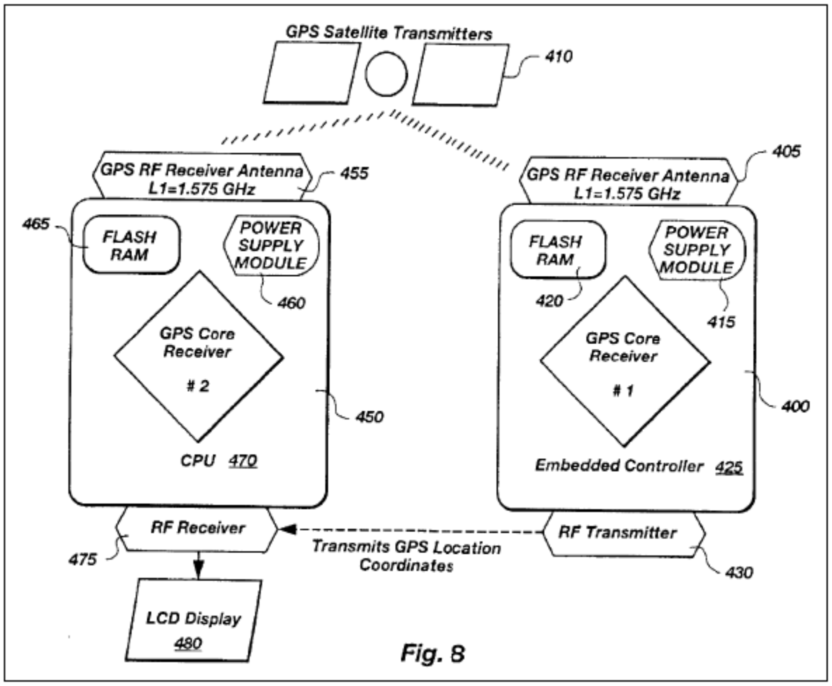
344. Norris describes that the portable devices are able to determine their respective positions. For example:

> "The first and second GPS devices are ***capable of determining their location in terms of longitude and latitude*** according to the methods well known to those skilled in the art through triangulation (location) and quadrangulation (location and elevation) formulas. The innovation of the present invention begins with the first GPS device 340 being modified to be a transceiver so as to transmit this location or location and elevation as telemetry data. Another point of novelty is that the second GPS device 350 is modified not only to receive GPS signals, but also to receive this telemetry data from the first GPS receiver."
>
> (*See* Norris, col. 6, lines 38-48, *emphasis added*)

345. Norris also provides a detailed figure showing the internal components of portable devices 340 and 350. For example:

> "FIG. 8 illustrates in block diagram form the basic components which are used in a preferred embodiment of the GPS devices 340, 350 receivers of the present invention. ***A first GPS device 400 comprises an RF receiving antenna 405 tuned to the GPS satellite broadcasting frequency of 1.575 GHz for receiving clock signals from the GPS Satellite transmitters 410 in orbit***. The first GPS device 400 contains a power supply module 415 and flash RAM 420 for storing computations. ***The GPS triangulation or quadrangulation calculations are made by an internal embedded controller 425 or microprocessor which uses GPS signals to calculate its location in terms of longitude and latitude***. This location is transmitted by means of an RF transmitter 430 to a second GPS device 450. ***This second GPS device 450 is similar to the first GPS device 400 in that the second device 450 also receives GPS satellite signals through an antenna 455, and contains a power supply 460 and flash RAM 465.*** However, the second GPS device 450 has a CPU 470 capable of handling more diverse tasks than the embedded controller 425 of the first GPS device 400. In addition, the second device 450 has an RF receiver 475 for receiving the transmitted location of the first GPS device 400."
>
> (*See* Norris, col. 9, lines 24-45, *emphasis added*)

346. Figure 8 is reproduced below.



Norris FIG. 8.

347. Colley discloses that the navigation and guidance system determines the user's position and course.

> "A navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow."
>
> (*See* Colley at Abstract, *emphasis added*)

348. Colley further describes that the user's position can be determined using a GPS receiver. For example:

> For example, when electronic charts are integrated with a ***positioning system such as the global positioning system (GPS),*** the user's position can be displayed in real time on a chart depicting the user's area.
>
> (*See* Colley, col. 1, lines 18-22, *emphasis added*)

> Embodiments of the invention operate with navigation hardware (not shown) which is implemented to ***provide information concerning the user's current position***, the user's COG data, and the position/coordinates of the desired destination. ***For example, the navigation hardware may include a GPS receiver or*** LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer to drive the displays.
>
> (*See* Colley, col. 3, lines 31-38, *emphasis added*)

> Embodiments of the present invention ***utilize data retrieved from a variety of navigation systems, such as the global positioning system (GPS),*** LORAN, inertial navigation, and/or radar systems in conjunction with Point-of-Closest-Approach (PCA) calculations. The PCA is the point along the current course that is closest to a predefined destination.
>
> (*See* Colley, col. 2, line 65 to col. 3, line 4, *emphasis added*)

> ***The user's position and COG are determined by the navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley, col. 2, lines 20-23, *emphasis added*)

c. a device for getting direction information denoting an orientation of said portable terminal

349. Norris discloses a device for getting a direction information denoting an orientation of said portable terminal. Specifically, Norris describes that each GPS device includes an internal compass. For example:

> This ability is crucial because the ***orientation of the second GPS device 350 relative to a compass may be changing constantly.*** Therefore, the present invention envisions that a user will be able to hold the second GPS device 350 and turn in a circle, and the arrow 354 will always point toward the first GPS device 340. This implies that the circle 360, if shown, also remains fixed relative to the compass. This ability is a result of an internal compass of the second GPS device 350. ***The internal compass provides a fixed reference point relative to which the continuously displayed arrow 354 will use to always point toward the first GPS device 340***.
>
> (*See* Norris, col. 7, lines 18-29, *emphasis added*)

350. Colley discloses that the navigation and guidance system determine the user's course and the course required to reach the desired destination from the current position. For example:

> A navigation and guidance system which ***directs a user toward a desired destination***. Position and steering information are integrated into a single display to allow the user to immediately ***determine whether the correct course is being traveled,*** and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow.

> (*See* Colley at Abstract, *emphasis added*)

351. Colley refers to the user's COG (Course over Ground), and the user's "track", which a PHOSITA would understand to be the current heading or direction of travel. For example:

> The actual track of the user is displayed relative to the segment waypoints such that the user's actual track is superimposed over the optimum route. The ***user's position and COG are determined by the navigation system*** and indicated on the display as a ***directional pointing icon***, such as a line or arrow."
>
> (*See* Colley, col. 2, lines 18-24, *emphasis added*)

> ***Current commercially available electronic chart display*** implementations typically ***indicate*** relevant geographic features, routes and waypoints, the user's position, ***and the user's track***.
>
> (*See* Colley, col. 1, lines 31-34, *emphasis added*)

352. Colley illustrates this, for example in Figure 1, reproduced below. In this figure, the dotted line 112 corresponds to the user's current track, and the angle of the arrow at the end of this line is the user's direction of travel. For example:

> For example, FIG. 1(a) shows the current implementation in most commercial systems. A desired route with dotted waypoints 102 is indicated by the straight lines 104 which comprise the intended track 114. The destination waypoint is shown as a circled dot 110, and ***the dotted line 112 indicates the user's actual track***. In the example, ***the arrow 116 at the top end of the dotted line 112 shows the user's position and current heading***.
>
> (*See* Norris, col.1, lines 45-53, *emphasis added*)

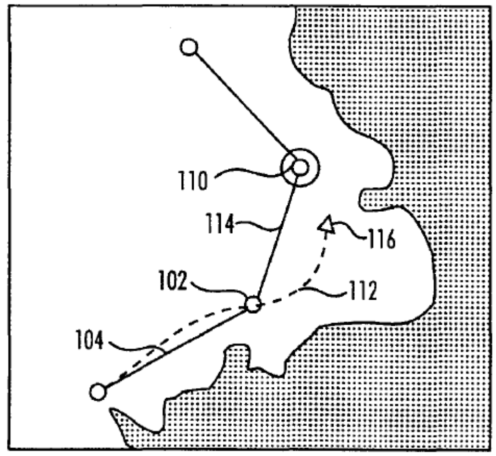


FIG. 1a

Colley FIG. 1a.

d. an input device for inputting a destination

353. Norris discloses a tuner device for inputting a destination. Specifically, Norris describes that the user may use the tuner to select a frequency so that the radio receiver in the device will receive signals transmitted by a specific device. This device may be another mobile terminal, for example one that the user is seeking to reach, or it may be a fixed location, such as a golf hole. For example:

> The system would further ***include the ability of the second GPS device to tune*** to a signal broadcast by different GPS transceiver devices. By ***selectively tuning to the signal of a desired GPS device,*** a distance of. direction to and elevation variance of a plurality of different GPS devices is possible.
>
> (*See* Norris, col. 3, line 65 to col. 4, line 2, *emphasis added*)

> A further modification is that ***the second GPS device 350 is advantageously and selectively tuneable to receive telemetry from a desired frequency***. This enables the second GPS device

350 to be be [sic] able to track multiple GPS devices. It is also ***possible to provide a tuner*** such that a plurality of GPS devices can be simultaneously tracked and displayed on the second GPS device 350 interface. These features also imply that the first GPS device 340 can advantageously selectively transmit telemetry on a desired frequency.

(*See* Norris, col. 6, lines 49-57, *emphasis added*)

A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. **A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole** on which the golfer is playing.

(*See* Norris, col. 9, lines 55-60, *emphasis added*)

Furthermore, not only would **selective tuning** to receive different GPS signals be possible, but GPS receivers could also selectively transmit on desired frequencies.

(*See* Norris, col. 10, lines 2-4, *emphasis added*)

The relative position indicating system of claim 9 wherein the at least another ***one of the plurality of GPS devices further comprises means for selectively tuning said receiving means to receive a desired telemetry frequency***.

(*See* Norris Claim 10, *emphasis added*)

While the preferred embodiment has discussed a first GPS device 350 which does not receive but only transmits telemetry data, and a second GPS device 350 which does the reverse, it should be obvious that the second GPS device 350 can be modified to transmit as well as to receive telemetry data, and that more than one of these modified second GPS 350 type devices can be used. ***This enables the users of a system of two second GPS type***

> ***devices 350 to simultaneously move toward each other as depicted in FIG. 10***.
> (*See* Norris, col. 7, lines 56-65, *emphasis added*)

354. A PHOSITA would have also found it obvious to use the frequencies of the various GPS units as names of destinations, as opposed to the destinations themselves. For example, a PHOSITA would understand that an address is an (hopefully) unambiguous name for a place so that a user seeking to go to a place can use the address as a type of name for that place. Similarly, many landmarks are identified by a name that has no direct relation to the specific location of the landmark (e.g., the geographic coordinates of the landmark). Thus, a PHOSITA would understand that using a frequency as a name for a destination would be no different than using any other type of name to represent the destination.

355. Colley describes that the destination is determined (or input) using the Navigation hardware that "*may include a GPS receiver or LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer*"**.** A PHOSITA would understand that the navigation hardware described by Colley would include a means for inputting the destination, for example by indicating it on an "electronic chart", since the navigation system would not, by itself, have this information. For example:

> Embodiments of the invention operate with ***navigation hardware*** (not shown) which is implemented to provide information concerning the user's current position, the user's COG data, and ***the position/coordinates of the desired destination***. ***For example, the navigation hardware may include a GPS receiver or LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer to drive the displays***.
>
> (*See* Colley, col. 3, lines 31-38)

> A positioning apparatus for indicating integrated directional and point of closest approach (PCA) information to a user traveling along a current course toward a desired destination, the positioning apparatus operable with a computer and a navigation system providing the user's current position data, destination position data, bearing data, and course-over-ground (COG) data, comprising: ***destination position means for indicating the position of the desired destination***; ….
>
> (*See* Colley at Claim 2, *partial excerpt*, , *emphasis added*)

> An integrated steering indicator operable with a programmable computer and a navigation system, the integrated steering indicator for displaying point of closest approach (PCA), route, and position information to a traveling operator, to direct the operator from an origin to a desired destination, the origin and desired destination having an associated origin waypoint and a destination waypoint, respectively, ***the positions of the origin and destination waypoints being determined by the navigation system***, respectively, the integrated steering indicator comprising: an origin waypoint indicator for displaying the position of the origin waypoint; ***a destination waypoint indicator for displaying the position of the destination waypoint relative to the origin waypoint***;…
>
> (*See* Colley at Claim 12, *partial excerpt*, *emphasis added*)

356. To the extent that it is determined that the tuner of Norris does not meet the limitation of an input device for inputting a destination, A PHOSITA would have found it obvious to use the navigation system of Colley to allow the user to enter destination information and thereby automatically tune the receiver to a frequency associated (in the database) with that destination.

357. Colley also describes that the destination and other waypoints are generated by a navigation system. For example:

> An integrated steering indicator operable with a programmable computer and a navigation system, the integrated steering indicator for displaying point of closest approach (PCA), route, and position information to a traveling operator, ***to direct the operator from an origin to a desired destination, the origin and desired destination having an associated origin waypoint and a destination waypoint, respectively, the positions of the origin and destination waypoints being determined by the navigation system***, respectively,…
>
> (*See* Colley Claim 12, *partial excerpt, , emphasis added)*

358. A skilled artisan seeking to improve on Norris's destination input mechanism (tuning to different radio signals for each different destination) would understand that using the navigation system of Colley to automatically input a set of waypoints in order to automatically tune the radio of Norris to the next waypoint once a given waypoint was reached, would yield a substantial reduction in user complexity, and would relieve the user from needing to remember a series of radio

frequencies, and thus this PHOSITA would be motivated to improve Norris through the teachings of Colley.

359. Such a combination of known elements, each performing the same function it had been known to perform would yield no more than one would expect (the easier input of destination input) from such an arrangement, and the combination would yield the predictable result of tuning the receiver of Norris to the frequency associated with a particular destination based on an input by the user, using Colley's navigation system. This combined system would have the advantage of avoiding the need for the user to recall the various frequencies associated with the destinations (e.g. golf holes), and thus would make the device easier to use.

e. a display

360. Norris discloses a display. For example:

> Finally, the second GPS device 450 advantageously has an ***LCD interface 480*** for indicating to the user the relative position of device 400 relative to the second GPS device 450.
>
> (*See* Norris, col. 9, lines 45-48, *emphasis added*)

> Specifically, the interface 352 of the second GPS receiver is shown in FIG. 5A and is comprised of ***an LCD screen 352***, such as the type used in portable notebook computers but smaller. The interface 352 consists of an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356. The

> circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass.
>
> (*See* Norris, col. 6, line 66 to col. 7, line 12, , *emphasis added, see also* Norris Figure 8)

361. Colley also discloses a display.

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are ***integrated into a single display*** to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. The user's position and course are determined by a navigation system and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley at Abstract, *emphasis added*)

> "The desired destination is ***displayed*** on an electronic charting system by a destination waypoint."
>
> (*See* Colley, col. 2, lines 12-14, *emphasis added*)

362. Colley Describes the details of the display in connection with Figure 2, reproduced below.

> The actual track of the user is ***displayed*** relative to the segment waypoints such that the user's actual track is superimposed over the optimum route. The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, such as a line or arrow.

(*See* Colley, col. 2, lines 18-23, *emphasis added*)

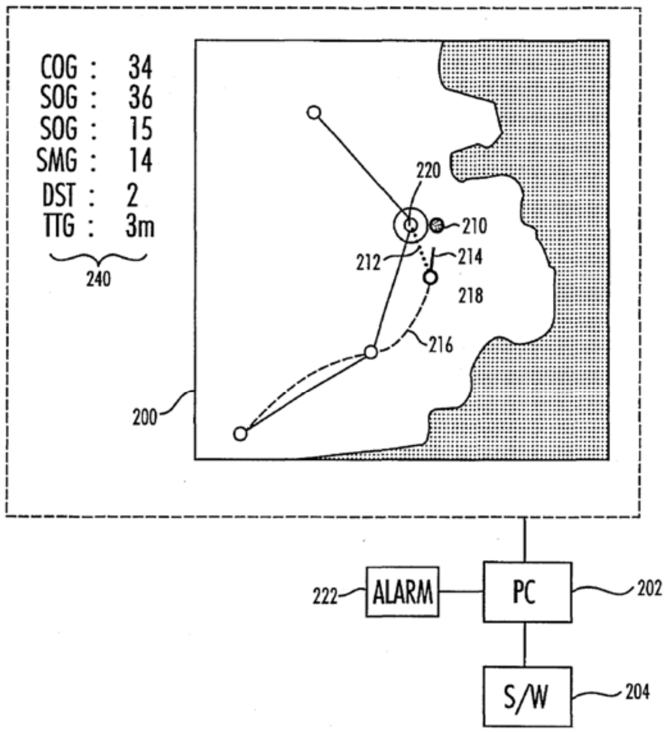


FIG. 2

Colley Figure 2

f. wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation

363. Norris discloses a display that "displays positions of said destination and said present place to said destination". For example:

> Finally, the second GPS device 450 advantageously has an LCD interface 480 for ***indicating to the user the relative position of device 400 relative to the second GPS device 450***.
>
> (*See* Norris, col. 9, lines 45-48, *emphasis added*)

> After receiving the telemetry transmission of the first GPS device 340, device 350 calculates a relative distance between the GPS receivers 340 and 350 by comparing absolute longitudes and latitudes. ***The interface of the second GPS device 350 then graphically displays the position of the first GPS device 340 relative to the second GPS device 350*** in an intuitive manner which facilitates immediate travel to the first GPS device 340 without consulting a map.
>
> (*See* Norris, col. 6, lines 58-65, *emphasis added*)

> FIG. 6 illustrates an alternative embodiment of the graphical screen display of FIGS. 5A and SD [sic]. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user, at a cost to the user of more circuitry and sophistication of the GPS devices. More intuitively useful information is displayed on the interface 352 by replacing the direction arrows 354 or 370 with a grid. Centered on ***the location of the user or second GPS device 350***, represented by some type of mark 372, are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. ***Finally, some type of mark 378 such as a small circle, square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked***.
>
> (*See* Norris, col. 8, lines 7-21, *emphasis added*)

364. This is illustrated by Figure 6, reproduced below.

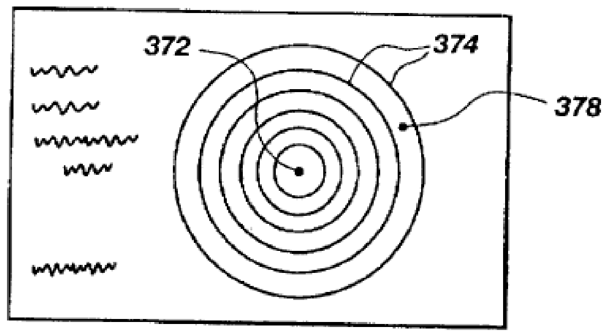
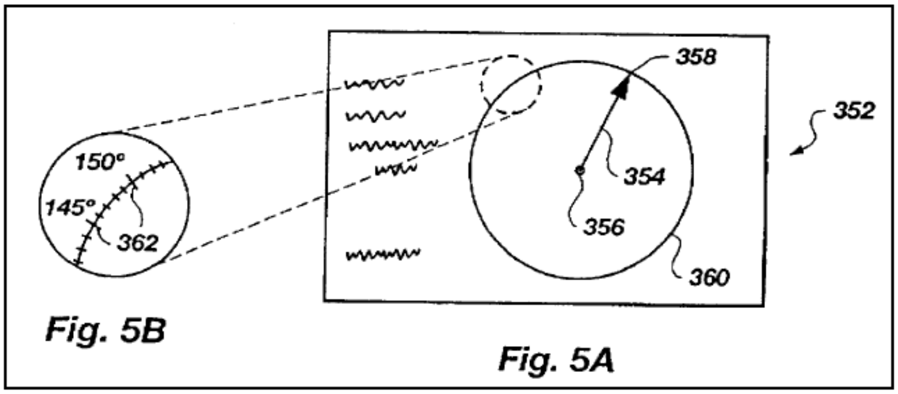


Fig. 6

365. Norris further discloses a display that displays “a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation”. For example:

> The interface 352 consists of an arrow 354, ***an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356***. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass.
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)



Norris FIG. 5A, FIG. 5B.

366. Norris describes that as the device is rotated, the displayed arrow will stay pointing at the other GPS device, and thus the display will change as the device orientation changes. For example:

> The feature described above is illustrated. for example. in FIG. 5C. ***For this drawing. the direction north of the fixed compass 368 is toward the top of the paper***. The direction "north" might be true north or magnetic north. ***The two GPS devices illustrated are the same GPS device 366. but shown in two different positions or orientations relative to the fixed 35 compass 368***. What remains constant (as long as the object being tracked does not move) is that the arrow 354 always points due east to some tracked GPS device whose telemetry data has been received by the pictured GPS device 366. Not shown because of the scale of the drawing is the fact that the 40 arrow 354 also points to the same tick mark 362 at approximately 90 degrees. the circle 360 and tick marks 362 also remain fixed relative to the compass 368.
>
> (*See* Norris, col. 7, lines 30-43, *emphasis added*)

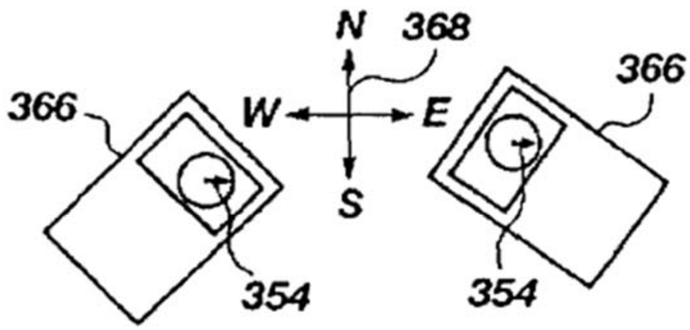


Fig. 5C

367. Norris discloses a portable terminal for walking navigation. For example, Figure 4, reproduced below indicates two terminals 340 and 350 which are shown as being held by two ***pedestrian (i.e. "walking")*** users.

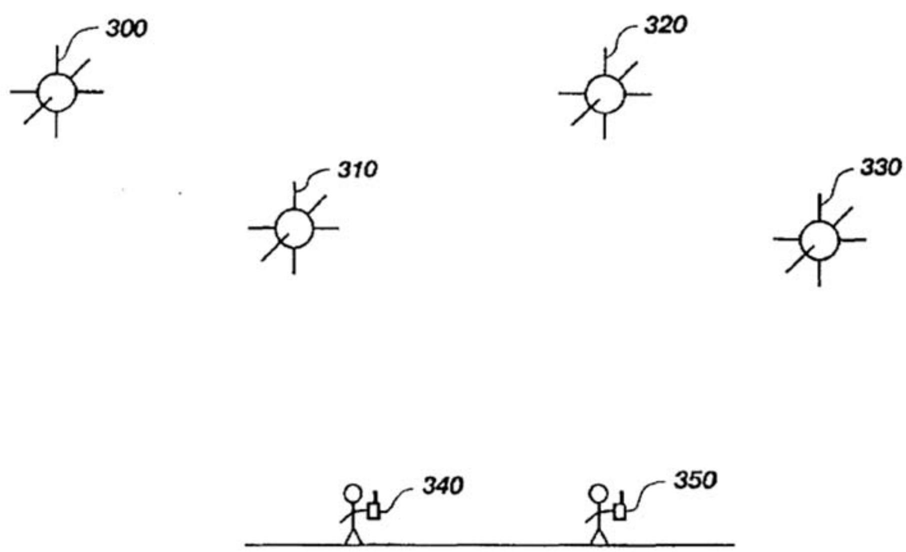


Fig. 4

Norris Figure 4

368. I note that because Norris illustrates the device being used by a user who is walking, it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

369. Colley discloses a display that "displays positions of said destination and said present place to said destination", and further discloses a display that "displays "a relation of said direction and a direction from said present place to said destination". For example:

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation system and indicated on the display as a directional pointing icon, such as a line or arrow***.
>
> (*See* Colley at Abstract, *emphasis added*)

> Thus, preferably the display 200 shows a graphical representation of numerical data combined with instantaneous course correction information. The actual track 216 of the user is designated as a dotted line. The PCA 210 is shown relative to ***the user's current position 218 and the destination waypoint 220***. *A* ***bearing-to-destination (BTD) indicator 212*** connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint.
>
> (*See* Colley, col. 3, lines 39-47, *emphasis added*)

> More particularly, in FIG. 3, the BTD indicator 212, ***the COG indicator 214***, and the PCA 210 are illustrated in enlarged detail. As explained above, by combining the steering and navigation indicators into a single, integrated display system 200 (FIG. 2), users can quickly and easily determine their current locations relative to the desired destinations 220, and how to best reach the desired destinations.
>
> (*See* Colley, col.47, lines 8-15, *emphasis added*)

> The ***user's position and COG are determined by the navigation system and indicated on the display*** as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley, col. 2, lines 20-23, *emphasis added*)

370. This is further illustrated in Figures 2 and 3 reproduced below, wherein the destination is labeled item 220, the current position is labeled 218, and the relative direction from the current heading to the destination is shown by the difference in angle between the course over ground (COG) indicator 214, and the bearing-to-destination line 212.

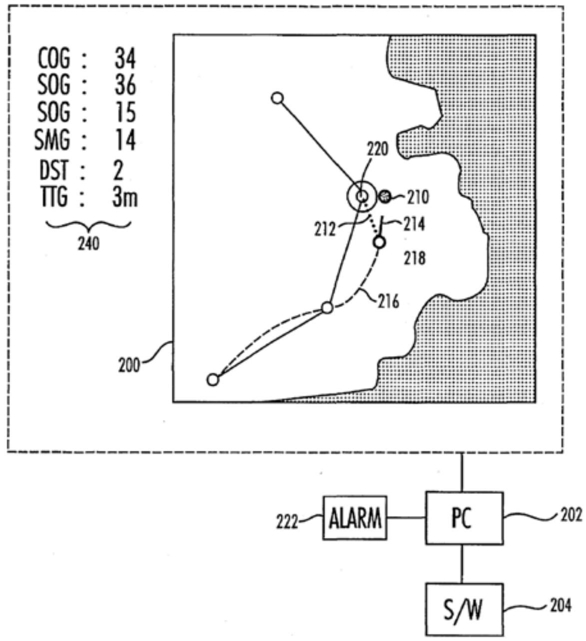


FIG. 2

Colley FIG. 2

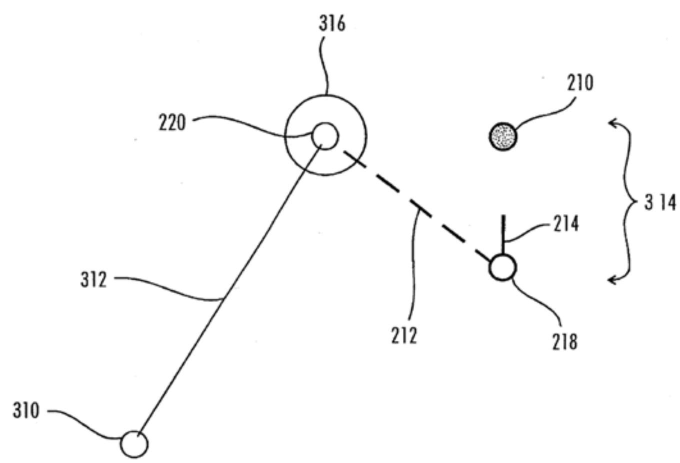


FIG. 3

Colley FIG. 3.

371. Colley also discloses that and "said display changes according to a change of said direction of said portable terminal orientation for walking navigation". For example:

> Accordingly, in preferred embodiments, as the computer and software arrangement continuously determines the COG and BRG values, and ***the corresponding graphical representations are displayed on the steering screen***, the user can manually or automatically direct the PCA indicator 210 toward the destination waypoint 220."
>
> (*See* Colley, col. 4, lines 53-58, *emphasis added*)

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. ***A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), distance to waypoint (DST), and the time to go (TTG).*** The numerical table or listing 240 is optional in that ***the numerical data is embodied by the movement of the graphical icons illustrated in the display 200.*** Accordingly, reference to a numerical coordinates table is unnecessary for steering and position correction or adjustment.
>
> (*See* Colley, col. 3, lines 19-30, *emphasis added*)

372. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian (i.e. "walking") applications, for example hiking.

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that ***embodiments of the invention may be incorporated into almost any type of moving object, system, or simply carried by a person***. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, ***hikers*** or horseback ***riders*** may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not.

(*See* Colley, col.5, lines 31-42, *emphasis added*)

373. I note that while Colley describes that the device could be "incorporated into almost any type of moving object", he specifically describes it as being "simply carried by a person. Because Colley does not require that a single instance of the device be capable of serving in both applications it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

ii. Claim 2

a. A portable terminal according to claim 1, wherein said direction from said present place to said inputted destination is denoted with an orientation of line"

374. Claim 2 depends from Claim 1 and adds the additional limitation "wherein said direction from said present place to said inputted destination is denoted with an orientation of line".

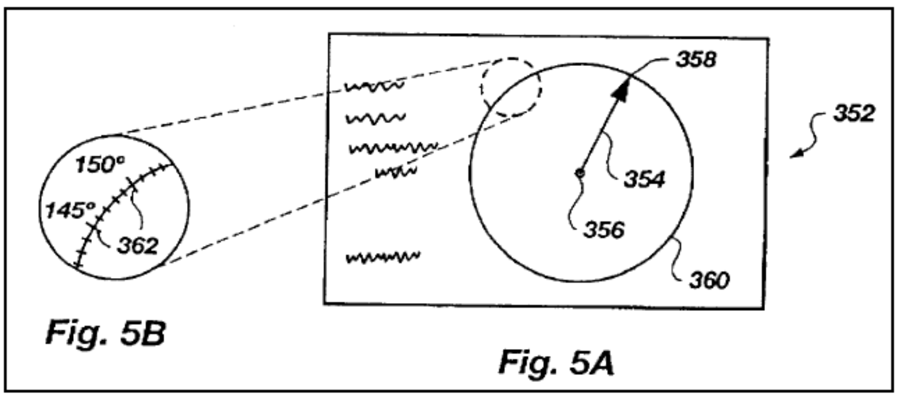
375. As described above, Norris in combination with Colley renders Claim 1 obvious.

376. Norris discloses that the direction from the current location ("present place") and the other GPS device (Inputted destination) is denoted by a line oriented in the direction of the destination. For example:

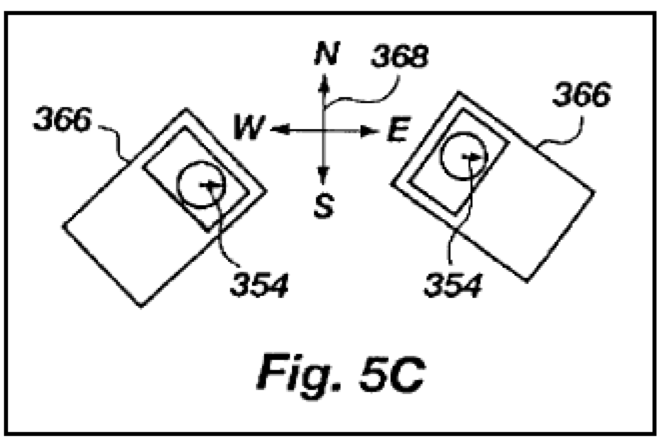
> The interface 352 consists of ***an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device*** 340. This is accomplished by pivoting or rotating the arrow 354 about the

> fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass.
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)

377. The "line" oriented to point in the direction of the destination is also illustrated as item 354 in Figures 5A, and 5C, reproduced below.



Norris FIG. 5A; FIG. 5B.



Norris FIG. 5C

> The feature described above is illustrated, for example, in FIG. 5C. For this drawing, the direction north of the fixed compass 368 is toward the top of the paper. The direction "north" might be true north or magnetic north. The two GPS devices illustrated are the same GPS device 366, but shown in two different positions or orientations relative to the fixed compass 368. What remains constant (as long as the object being tracked does not move) is that ***the arrow 354 always points due east to some tracked GPS device whose telemetry data has been received by the pictured GPS device 366***. Not shown because of the scale of the drawing is the fact that the arrow 354 also points to the same tick mark 362 at approximately 90 degrees, the circle 360 and tick marks 362 also remain fixed relative to the compass 368.
>
> (*See* Norris, col. 7, lines 21-44)

378. Colley describes that the display includes a "bearing-to-destination indicator" that is represented on the display as a dotted line from the current position to the destination. For example:

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), distance to waypoint (DST), and the time to go (TTG).
>
> (*See* Colley, col. 3, lines 19-25)
>
> A bearing-to-destination (BTD) indicator 212 connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint."
>
> (*See* Colley, col 3, lines 44-47)

379. This is illustrated as item 212 in Figures 2 and 3, reproduced below.

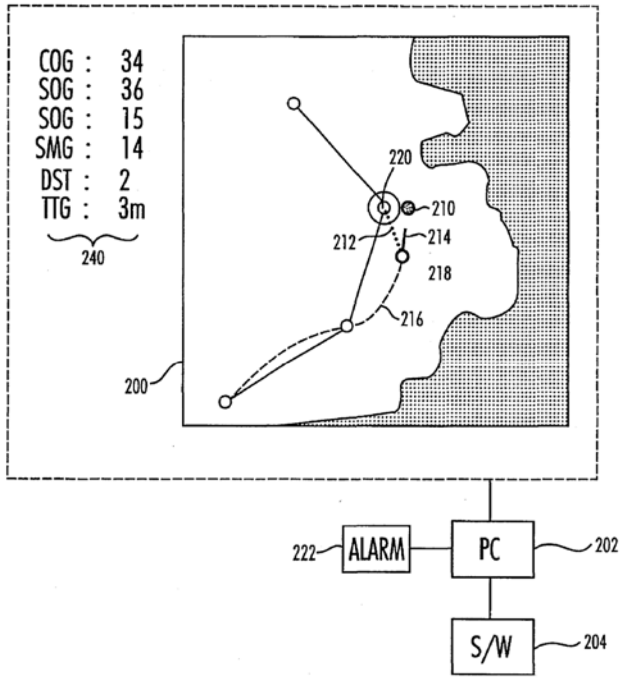


FIG. 2

Colley FIG. 2

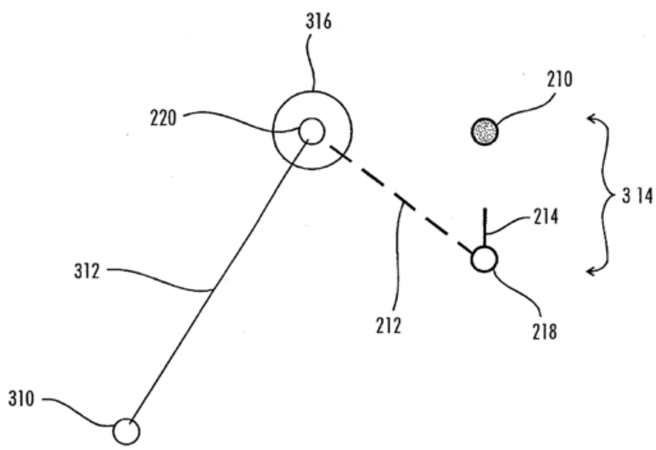


FIG. 3

Colley FIG. 3.

"The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, **such as a line or arrow**."

(*See* Colley, col. 2, lines 18-23)

iii. Claim 3

a. A portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number

380. Claim 3 depends from Claim 1 and adds the additional limitation "wherein a distance between said present place and said destination is denoted with a number".

381. As described above, Norris in combination with Colley renders Claim 1 obvious.

382. Norris discloses that the distance to the other device (Destination) may be indicated in several ways. First, Norris discloses that indicating the distance to a destination was well-known in the art, and thus would have been obvious to a PHOSITA. For example, Norris discloses that the prior art included a "distance indicator".

> A ***distance indicator 75 also shows a relative distance to the transmitter 10*** by indicating the strength of the signal received. (*See* Norris, col. 5, lines 7-9, *emphasis added*)

383. This distance indicator is shown in Figure 1, reproduced below.

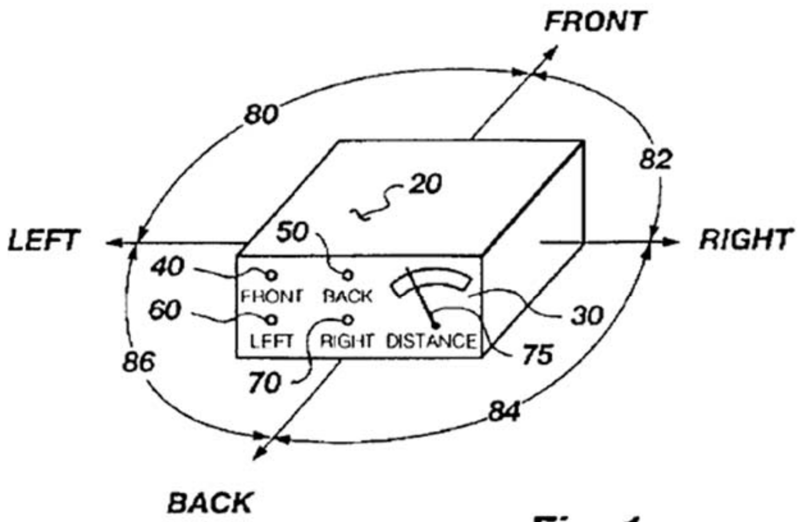


Fig. 1
(PRIOR ART)

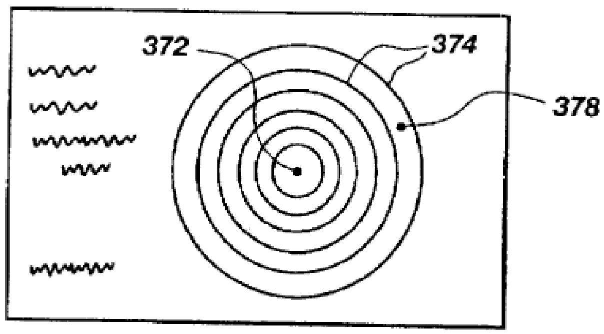
Norris Fig. 1

384. Norris also describes that the distance to the other device (destination) may be indicated in text on the display. For example:

> ***Distance, as well as other useful but presently nongraphically displayed information is displayed as text in an unused portion of the LCD screen 352***. This information includes but is not limited to the selected telemetry frequency or frequencies of remote first GPS devices 340. It is also possible to choose a units of distance for the displayed distance measurement shown as text so as to conform to user preferences for the U.S. or metric system.
>
> (*See* Norris, col. 7, lines 48-55, *emphasis added*)

385. Norris also discloses a graphical means for indicating the distance to the other terminal (destination). In this case, the display is configured with concentric rings indicating increments of distance from the current location 372, which is

indicated at the center of the rings, and the other terminal 378. This is illustrated in Figure 6, reproduced below.



Norris Fig. 6

386. Norris also describes this display. For example:

> FIG. 6 illustrates an alternative embodiment of the graphical screen display of FIGS. 5A and SD [sic]. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user, at a cost to the user of more circuitry and sophistication of the GPS devices. More intuitively useful information is displayed on the interface 352 by replacing the direction arrows 354 or 370 with a grid. Centered on ***the location of the user or second GPS device 350***, represented by some type of mark 372, are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. ***Finally, some type of mark 378 such as a small circle, square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked***.
>
> (*See* Norris, col. 8, lines 7-21, *emphasis added*)

387. Norris also describes a distance and elevation display wherein the location of the other terminal (destination) can be shown in distance and vertical elevation. For example, as shown in Figures 7A and 7B reproduced below.

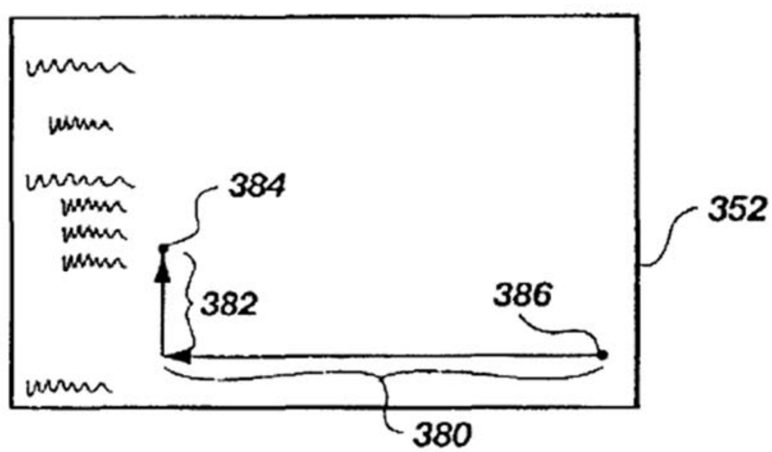


Fig. 7A

Norris Fig 7a

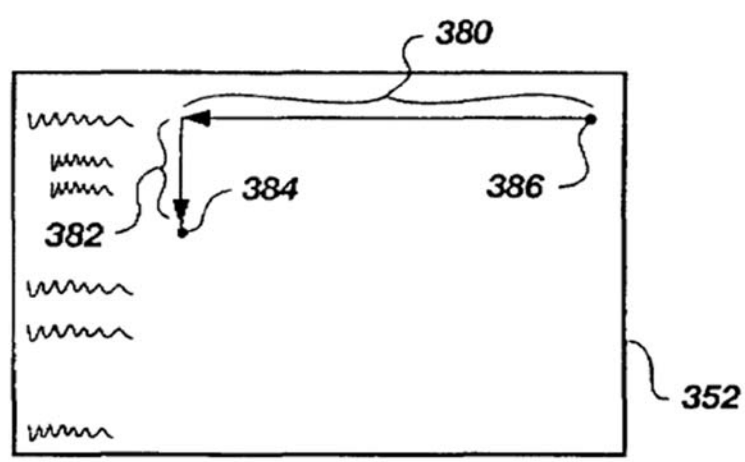


Fig. 7B

Norris Fig 7b,

388. Norris describes this display:

> Therefore, graphical display of elevation relative to distance is provided by toggling between a screen providing graphical direction information (FIG. 5A) or graphical direction and distance information (FIG. 6) to a screen as shown in FIGS. 7 A or 7B. ***This screen 352 displays the horizontal distance to travel 380 on the horizontal axis 380. and an elevation variance 382 when on a meaningful scale.***
>
> (*See* Norris, col. 9, lines 1-7, *emphasis added*)

389. Norris also provides a typical application of the invention which includes knowing the distance and direction to a golf hole that is not visible from the current location.

> Variations on the preferred embodiment are possible depending upon the particular application of the present invention. A particular example of ***an application for which the present invention is particularly suited is for a golf course***. A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is playing. I***f the golf hole 510 is obscured by a hill or foliage 540. the golfer 550 will always know the precise distance and direction to aim***. and consequently, will be better able to choose a club.
>
> (*See* Norris, col. 9, lines 51-63, *emphasis added*)

390. Colley also describes providing the distance from the current position to the destination as a number. For example:

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), **distance to waypoint (DST)**, and the time to go (TTG). The **numerical table or listing 240** is optional in that the numerical data is embodied by the movement of the graphical icons illustrated in the display 200.
>
> (*See* Colley, col. 3, lines 19-28, *emphasis added*)

391. This numerical display of distance is also shown in Figure 2, reproduced below. Here the designator "DST" is used to identify the distance to the destination.

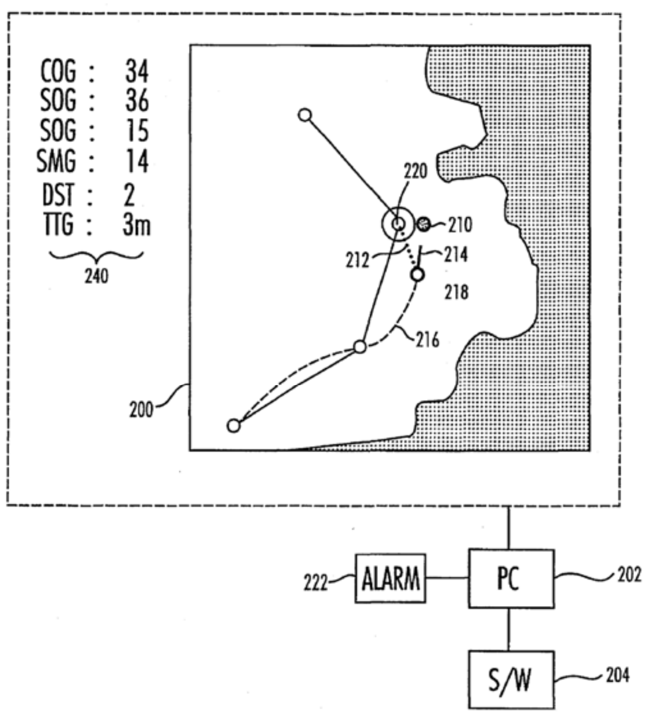


FIG. 2

Colley FIG. 2

iv. Claim 10

392. Claim 10 is an independent claim.

a. A portable terminal, comprising:

393. This element is common with Claim 1. As described above, Norris in combination with Colley renders Claim 1 obvious. See Claim 1 analysis.

b. a device for getting location information denoting a present place of said portable terminal;

394. This element is common with Claim 1. As described above, Norris in combination with Colley renders Claim 1 obvious. See Claim 1 analysis.

c. a device for getting direction information denoting an orientation of said portable terminal;

395. This element is common with Claim 1. As described above, Norris in combination with Colley renders Claim 1 obvious. See Claim 1 analysis.

d. a device for getting a location information of another portable terminal from said another terminal via connected network;

396. Norris discloses a device for getting a location information of another portable terminal from said another terminal via connected network. Specifically, Norris discloses a radio receiver that us tuned to the transmission frequency of the other terminal, so that it can receive broadcast of position from the other terminal. For example:

> "The GPS triangulation or quadrangulation calculations are made by an internal embedded controller 425 or microprocessor which uses GPS signals to calculate its location in terms of longitude and latitude. This location is transmitted by means of an ***RF transmitter 430 to a second GPS device 450***." (*See* Norris, col. 9, lines 32-37)

> "In addition, ***the second device 450 has an RF receiver 475 for receiving the transmitted location of the first GPS device 400***." (*See* Norris, col. 9, lines 43-45)

> "A further modification is that the ***second GPS device 350 is advantageously and selectively tuneable to receive telemetry from a desired frequency. This enables the second GPS device 350 to be able to track multiple GPS devices***. It is also possible to provide a tuner such that a plurality of GPS devices can be simultaneously tracked and displayed on the second GPS device 350 interface. These features also imply that the first GPS device 340 can advantageously selectively transmit telemetry on a desired frequency."
>
> (*See* Norris, col. 6, lines 49-57)

> "Returing now to the system of GPS devices, ***the second GPS device 350 is constantly receiving updated telemetry data from the first GPS device 340*** and from the GPS satellites 300, 310, 320, 330 overhead. "
>
> (*See* Norris, col. 7, lines 13-16

> "While the preferred embodiment has discussed a first GPS device 350 which does not receive but only transmits telemetry data, and ***a second GPS device 350 which does the reverse, it should be obvious that the second GPS device 350 can be modified to transmit as well as to receive telemetry data, and that more than one of these modified second GPS 350 type devices can be used. This enables the users of a system of two***

> ***second GPS type devices 350 to simultaneously move toward each other as depicted in FIG. 10*.”**
> (*See* Norris, col. 7, lines 56-65)

397. A PHOSITA would understand that telemetry, as described above in relation to a radio signal would be a wireless connection, and both GPS devices 340 and 350 would be thus connected by a wireless link. In the event that the Court determines this limitation is governed by 35 U.S.C. § 112(6). Norris discloses the function of getting a location information of another portable terminal via connected network; Norris also discloses a structure that performs the specified function, including an RF receiver or equivalent hardware, software.

e. a display

398. This element is common with Claim 1. As described above, Norris in combination with Colley renders Claim 1 obvious. See Claim 1 analysis.

f. wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination, and said display changes according to a change of said direction of said portable terminal orientation for walking navigation.

399. This element is common with Claim 1. As described above, Norris in combination with Colley renders Claim 1 obvious. See Claim 1 analysis.

v. Claim 15

a. A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving

a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow"

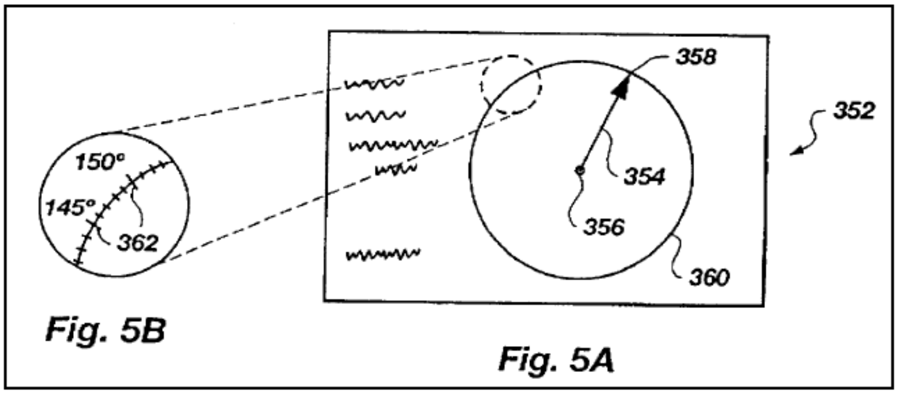
400. Claim 15 depends from Claim 1, and adds the further limitation "a device for retrieving a route from said present place to said destination, wherein said display displays said route and displays a direction of movement by the arrow".

401. As described above, Norris in combination with Colley renders Claim 1 obvious.

402. Norris discloses that the direction from the current location ("present place") and the other GPS device (Inputted destination) is denoted by an arrow oriented in the direction of the destination. Under the broadest reasonable interpretation, this arrow comprises the route from the present location to the destination. For example:

> The interface 352 consists of ***an arrow 354, an end 356 of the arrow 354 generally fixed on the display 352 and an opposite pointing end 358 of the arrow 354 which continuously points in the direction of the first GPS device*** 340. This is accomplished by pivoting or rotating the arrow 354 about the fixed end 356. The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass.
>
> (*See* Norris, col. 7, lines 2-12, *emphasis added*)

403. The "arrow" oriented to point in the direction of the destination is also illustrated as item 354 in Figures 5A, and, reproduced below.



Norris FIG. 5A; FIG. 5B.

404. By way of a practical application wherein the route is

405. Norris describes that the arrow will guide the user to a hidden golf hole, thereby providing them with a "route", indicated by an arrow.

> Variations on the preferred embodiment are possible depending upon the particular application of the present invention. A particular example of ***an application for which the present invention is particularly suited is for a golf course***. A golf hole is illustrated in FIG. 9. Each golf hole 510 of the course 500 would be equipped with a GPS device 520 capable of transmitting a GPS determined position. A golfer would tune a GPS device 530 to receive telemetry on a predetermined frequency assigned to a particular hole on which the golfer is playing. I***f the golf hole 510 is obscured by a hill or foliage 540. the golfer 550 will always know the precise distance and direction to aim***. and consequently, will be better able to choose a club.
>
> (*See* Norris, col. 9, lines 51-63, *emphasis added*)

406. In addition, Norris discloses a portable terminal for walking navigation. For example, Figure 4, reproduced below indicates two terminals 340 and 350 which are shown as being held by two ***pedestrian (i.e. "walking")*** users.

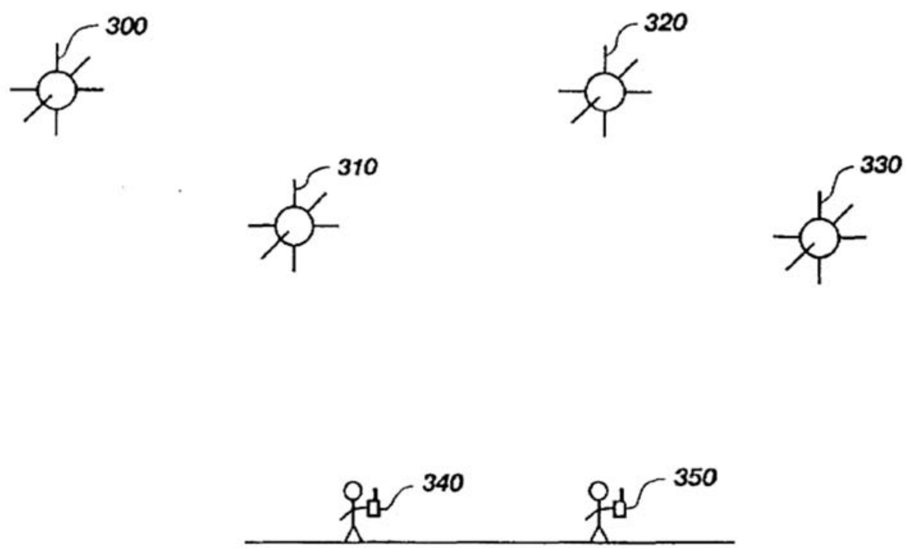


Fig. 4

Norris Figure 4

407. Colley describes a device for retrieving a route from a current position (present place) to a destination. In the Colley system, the Navigation System provides (or retrieves) a set of "waypoints". A PHOSITA would understand that these waypoints represent the starting point, intermediate destinations between the starting point and the final destination, and that the path connecting these waypoints is commonly known as the "route". The final destination is simply the last waypoint in the set. For example:

> ***Current commercially available electronic chart display implementations typically indicate relevant geographic features, routes and waypoints***, the user's position, and the user's track.
>
> (*See* Colley, col. 1, lines 32-34, *emphasis added*)

408. Colley also describes that the "display displays said route" (lines 104 and 114 in Figure 1 above), and displays the direction of movement using an arrow (illustrated as item 116 in Figure 1, above). For example:

> For example, FIG. l(a) shows the current implementation in most commercial systems. ***A desired route with dotted waypoints 102 is indicated by the straight lines 104 which comprise the intended track 114***. The destination waypoint is shown as a circled dot 110, and the dotted line 112 indicates the user's actual track.
>
> (*See* Colley, col. 1, lines 45-50, *emphasis added*, *see also* FIG. 1a)

> The user's position and COG are determined by the navigation system and indicated on the display as a ***directional pointing icon, such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

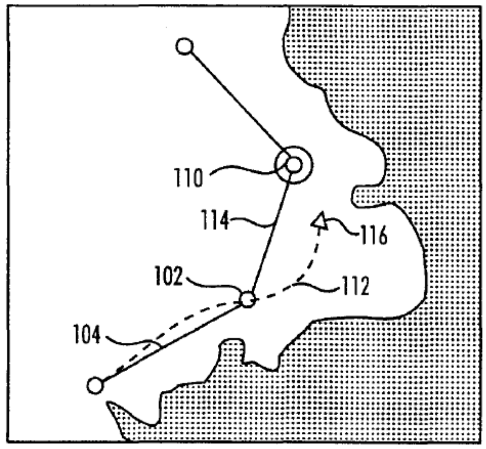


FIG. 1a

409. Colley Also describes this limitation in connection with Figure 3 where the legs of the route are described as lines connecting waypoints. For example

> An origin waypoint 310 represents one of the segment waypoints, as shown in FIG. 2. ***The origin waypoint is often described with respect to point-to-point navigation, which allows the user to follow multiple straight-line segments along a route.*** The origin waypoint indicates the beginning of the leg, while the destination waypoint indicates the end of the leg. ***By connecting the points along the route, each origin and destination waypoint describes a leg of the route, which is shown in FIG. 3 as a desired track 312***.
>
> (*See* Colley, col. 4, lines 16-24, *emphasis added*)

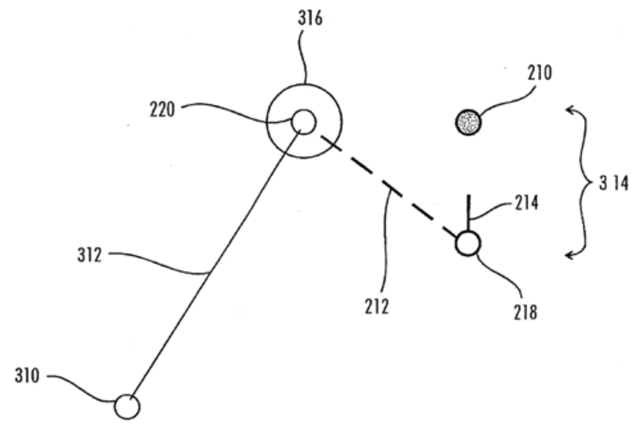


FIG. 3
Colley FIG. 3

410. To the extent that the directional line and arrow of Norris is not found to represent a "route", a PHOSITA would find it obvious to supplement the line display of Norris with the more complete route display of Colley. The intent of the system described by Colley is to provide an improved display technique, applicable to a variety of navigation applications, wherein the user is provided directional or steering information so that they can know what direction to travel to reach their destination. Thus, both systems provide the same type of directional indication to guide a user to a destination.

411. Colley's focus is specifically on the display of such guidance information, and, in particular providing an improved display that is more intuitive and more effective at guiding the user to the destination. A PHOSITA implementing the system of Norris would thus be motivated to use this improved display technique described by Colley, and in doing so would be confident that this simple

substitution of one known element for another would yield the predictable result of a more intuitive and easily understood guidance display, in this case displaying multiple segments of the route so that the user would better understand the upcoming maneuvers. In this combination, each of the systems would be performing the same function it had been known to perform (i.e. the frequency based beacon functionality of Norris providing selectable destinations for locations such as golf holes, and the display functionality of Colley) and would yield no more than one would expect from such an arrangement. In addition, such a combination would represent no more than the combination of known elements to produce a predictable result.

vi. Claim 16

a. A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route.

412. Claim 16 depends from Claim 15, which depends from Claim 1, and adds the further limitation "wherein said display further displays said grid information of said route".

413. As described above, Norris in combination with Colley renders Claim 1, and claim 15 obvious.

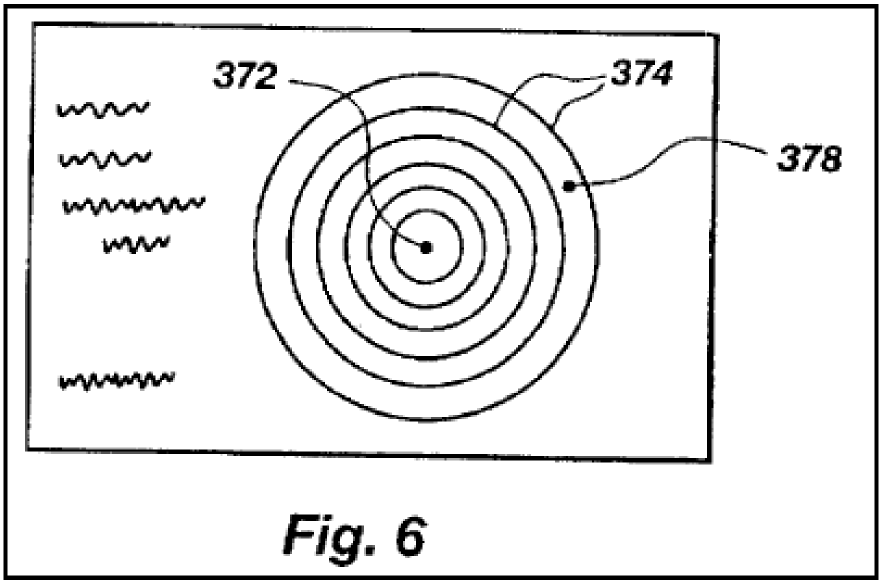
414. Norris discloses a graphical means for indicating the distance to the other terminal (destination). In this case, the display is configured with concentric rings

indicating increments of distance from the current location 372, which is indicated at the center of the rings, and the other terminal 378.

415.

> FlG. 6 illustrates an alternative embodiment of the graphical screen display of FlGS. SA and SD. The displayed information can be modified to present different and advantageously more useful and intuitive information to the user at a cost to the user of more circuitry and sophistication of the GPS devices. **More intuitively useful information is displayed on the interface 3S2 by replacing the direction arrows 354 or 370 with a grid**. Centered on the location of the user or second GPS device 3SO. represented by some type of mark 372. are a plurality of increasingly larger concentric circles 374. The circles 374 are scaled so as to represent uniformly spaced distances. Finally. some type of mark 378 such as a small circle. square or other designation which is easily visible on the screen represents the first GPS device 340 which is being tracked.
>
> (*See* Norris, col. 8, lines 7-21)

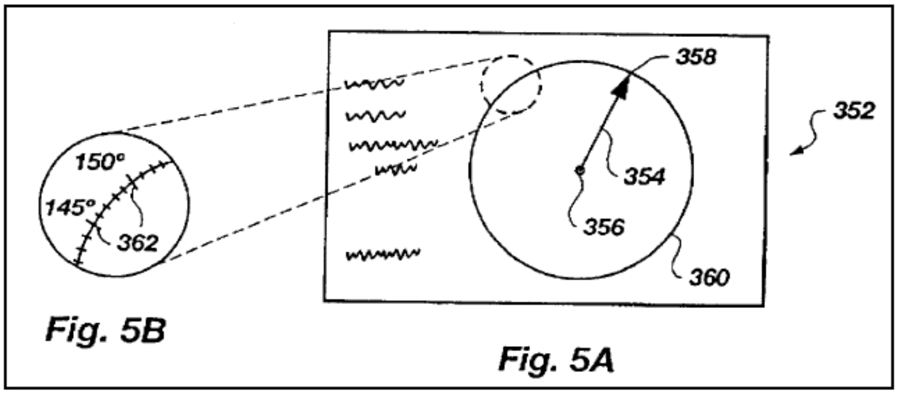
416. This is illustrated in Figure 6, reproduced below. As can be appreciated in the figure, the concentric rings represent the radial distance coordinates of a polar coordinate grid.



Norris Fig. 6

417. Norris also describes that the outer ring of the displayed circle includes tick marks representing to directional coordinates (i.e. degrees of angle) of the polar coordinate grid. For example:

> "The circle 360 defines the limit of travel of the arrow 354 on the interface 352 and does not need to be shown. However, if left on the display, ***the circle 360 can be conveniently divided by tick marks 362, as shown in close-up view FIG. 5B. The tick marks 362 represent the 360 degrees of a compass."*** (*See* Norris, col. 7, lines 7-12)



Norris Figs. 5B and 5B

vii. Claim 17

a. A portable terminal with walking navigation according to claim 15, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route

418. Claim 17 depends from Claim 15, which depends from Claim 1, and adds the further limitation" wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route".

419. As described above, Norris in combination with Colley renders Claim 1 and claim 15 obvious.

420. Colley describes that the route is represented on the display as a sequence of linked line segments connecting the various waypoints. As can be appreciated in the Figures 1 and 2 below, the resulting line follows the waypoints, and this

defines the route. As the waypoints are not necessarily collinear, the line will be "bent".

> The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, ***such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

> Thus, preferably the display 200 shows a graphical representation of numerical data combined with instantaneous course correction information. The ***actual track 216*** of the user is designated as a dotted line. The PCA 210 is shown relative to ***the user's current position 218 and the destination waypoint 220***. *A* ***bearing-to-destination (BTD) indicator 212*** connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint.
>
> (*See* Colley, col. 3, lines 39-47, *emphasis added*)

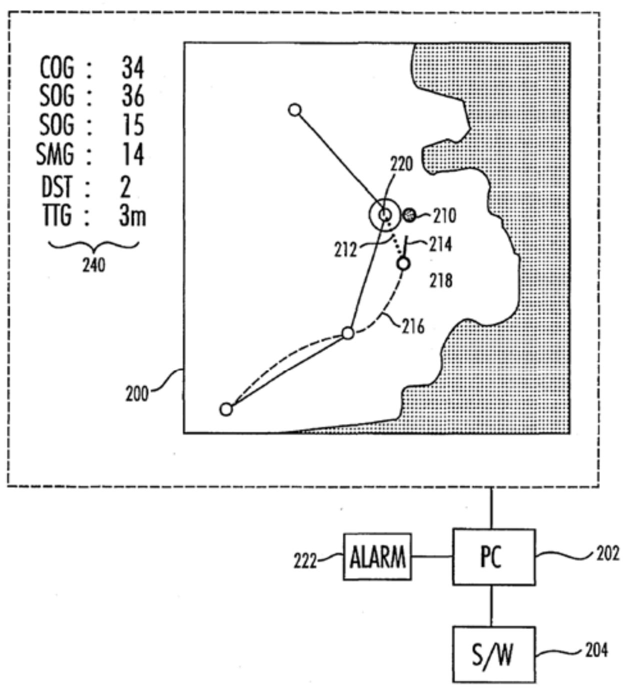


FIG. 2

Colley FIG. 2

> An origin waypoint 310 represents one of the segment waypoints, as shown in FIG. 2. The origin waypoint is often described with respect to point-to-point navigation, which allows the user ***to follow multiple straight-line segments along a route.*** The origin waypoint indicates the beginning of the leg, while the destination waypoint indicates the end of the leg. By connecting the points along the route, each origin and destination waypoint describes a leg of the route, which is shown in FIG. 3 as a desired track 312.
>
> (*See* Colley, col. 4, lines 16-24, *emphasis added*)

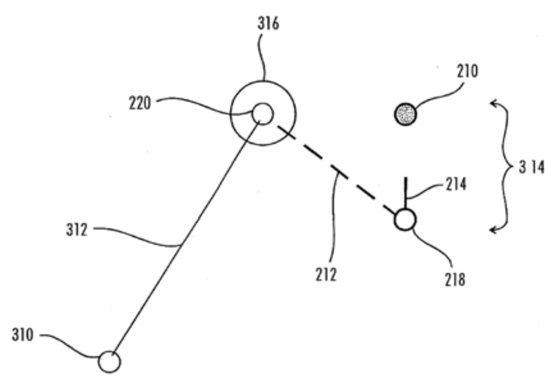


FIG. 3

Colley FIG. 3

421. In my opinion, a PHOSITA would find it obvious to employ the route display technique described by Colley to the system of Norris. The intent of the system described by Colley is to provide an improved display technique, applicable to a variety of navigation applications, wherein the user is provided directional or steering information so that they can know what direction to travel to reach their destination. Thus, both systems provide the same type of directional indication to guide a user to a destination.

422. Colley's focus is specifically on the display of such guidance information, and, in particular providing an improved display that is more intuitive and more effective at guiding the user to the destination. A PHOSITA implementing the system of Norris would thus be motivated to use this improved display technique described by Colley, to present a more complete route from the current location to the desired destination, as opposed to merely indicating the direction to the destination. In doing so, a PHOSITA would be confident that this simple substitution of one known element for another would yield the predictable result of a more intuitive and easily understood guidance display, in this case displaying multiple segments of the route so that the user would better understand the upcoming maneuvers. In this combination, each of the systems would be performing the same function it had been known to perform (i.e. the frequency based beacon functionality of Norris providing selectable destinations for locations such as golf holes, and the display functionality of Colley indicating a more complete route to the destination) and would yield no more than one would expect from such an arrangement. In addition, such a combination would represent no more than the combination of known elements to produce a predictable result.

viii. Claim 20

a. A portable terminal with walking navigation according to claim 17, wherein said display displays said route with a bent line using symbols denoting starting and

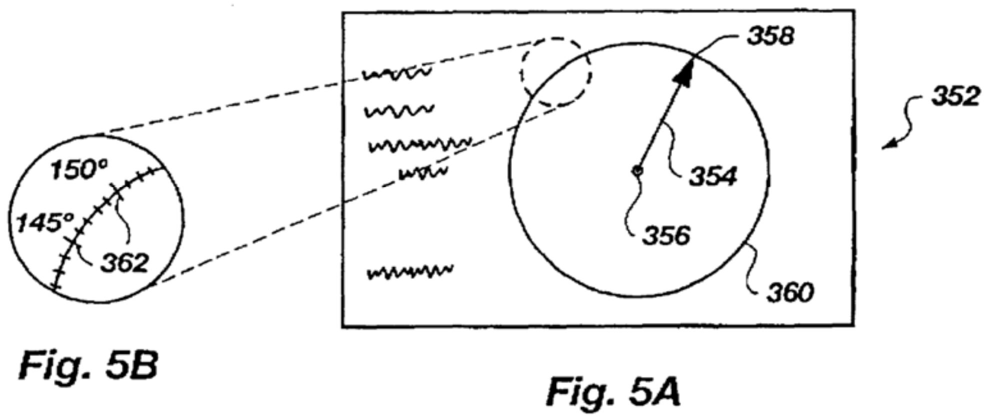
ending points and displays symbols denoting said present place on said route.

423. Claim 20 depends from Claim 17, which depends from Claim 15, which depends from Claim 1, and adds the further limitation "wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route".

424. For the same reasons presented above in relation to Claim 17, this claim is also invalid.

ix. The Combination of Norris and Colley

425. A PHOSITA would find it obvious to combine the teachings of Norris and Colley. Both references describe portable devices that provide directional guidance to a destination using a pointer or arrow. Norris describes a handheld device that is tuned to the transmission frequency of another device that transmits its location information over a radio signal. Using this information and the current location of the unit, it then displays the location of the transmitting unit on the display screen together with an indication of the relative direction and distance to that unit. This is illustrated, for example in Figures 5 A and 5b reproduced below.



Norris Figures 5A & 5B

426. Colley describes a display technique, applicable to a variety of navigation applications, wherein the user is provided directional or steering information so that they can know what direction to travel to reach their destination.

427. Thus, both systems provide the same type of directional indication to guide a user to a destination.

428. Both Norris and Colley also describe providing distance to the destination as part of the display. And both provide a mechanism for inputting a destination.

429. As a result, A skilled artisan implementing the system of Norris would be aware of references such as Colley, and would seek to use them to improve on the system of Norris.

G. Claims 6-8 of the ’317 Patent are Anticipated and/or rendered obvious by Nojima

430. In my opinion Nojima renders obvious Claims 6-8 of the ‘317 patent. In the sections below I have laid out the basis for my opinion for the various claim elements.

i. Claim 6

431. Claim 6 is an independent Claim.

a. A portable terminal, comprising

432. Nojima describes a mobile terminal device that is able to determine the mode of transport based on speed, route and other factors. Nojima describes this device as being, for example used in mobile phones. For example:

> The present invention pertains to a ***mobile terminal device*** that comprises a current-position detection means and a map-information storage means and thereby provides information associated with the current position on the map. ***The present invention also pertains to a device consisting of an integrated combination of the above-mentioned mobile terminal device and the communication means, such as a mobile phone***, PHS (Personal Handy Phone), etc., which uses a cellular communication system.
>
> (*See* Nojima at ¶ [0001], *emphasis added*)

> “The ***mobile terminal device*** is accommodated within a compact main body so that the user may carry it around.”
>
> (*See* Nojima at ¶ [0004], *emphasis added*)

> “The ***mobile terminal device*** according to the present invention is a device having a current-position detection means and a map-information storage means, thereby providing information associated with the current position on the map.”

> (*See* Nojima at ¶ [0008], *emphasis added*)

433. Nojima notes specifically that the device is portable, and may be used while the user is "on foot" i.e., "walking".

> The ***mobile terminal device can be used in a portable fashion*** and is therefore used during the use of various travel modes.
>
> (*See* Nojima at ¶ [0010], *emphasis added*)

> For example, ***it may be carried around by the user while traveling on foot***, or it may be placed on a seat in a car.
>
> (*See* Nojima at ¶ [0018], *emphasis added*)

b. a device for getting a location information denoting a present place of said portable terminal

434. Nojima discloses a device for getting location information denoting a present place of said portable terminal. Specifically, Nojima describes that the system includes a "current position detection means".

> The present invention pertains to a mobile terminal device that ***comprises a current-position detection means*** and a map-information storage means and ***thereby provides information associated with the current position on the map***.
>
> (*See* Nojima at ¶ [0001], *emphasis added*)

435. And that the current position detection means uses a satellite navigation system such as differential GPS (DGPS). For example:

> The mobile terminal device according to the present invention is a device having a current-position detection means and a map-information storage means, thereby providing information

> associated with the current position on the map…. ***It should be noted that the current-position detection means is configured to detect the current position through the use of a satellite navigation system***, autonomous navigation system, radio navigation system, etc.; and said methods may be used in combination.
>
> (*See* Nojima at ¶ [0008], *emphasis added*)

> The ***DGPS device 12*** combines error information (which is supplied via FM multiplex broadcast, etc., and is stored in the GPS device) ***with the position data obtained from the GPS device*** (which detects the current position through the use of signals from satellites) ***so as to thereby detect the current position more accurately***.
>
> (*See* Nojima at ¶ [0015], *emphasis added*)

436. A PHOSITA would understand that DGPS is the acronym for "Differential GPS"[5]

> The ***absolute-position computation part 22 calculates the absolute current position through the use of the output of the DGPS device 12***, the computation result of the dead-reckoning-navigation computation part 20, and the map information of the map/transportation system databases 18.
>
> (*See* Nojima at ¶ [0019], *emphasis added*)

[5] See, e.g. McGraw Hill Electronics Dictionary, by Neil Sclater and John Markus, © 1997 McGraw Hill, Inc, ISBN0-07-057837-0, page 121

c. a device for getting direction information denoting an orientation of said portable terminal

437. Nojima discloses a device for getting direction information denoting an orientation of said portable terminal. Specifically, Nojima describes that the mobile terminal includes a "tri-axial compass" that "detects the absolute orientation" of the mobile terminal. For example:

> The mobile terminal device according to yet another aspect of the present invention further comprises a ***triaxial gyroscope*** and a ***triaxial compass***. This makes it possible to accurately detect the amount of movement, etc., regardless of the direction in which the mobile terminal device is situated.
>
> (*See* Nojima at¶ [0013], *emphasis added*)

> And, ***the triaxial compass 16 is a sensor that detects the absolute orientation***. Thus, the posture of mobile terminal device is identified based on the output from the triaxial compass 16.
>
> (*See* Nojima at [0016], *emphasis added*)

> In the present embodiment, a triaxial gyroscope 14 and ***a triaxial compass 16*** are provided, thereby ***making it possible to accurately detect the relative amount of movement, etc., regardless of the direction in which the mobile terminal device is mounted.*** The mobile terminal device is used in various postures/positions. For example, it may be carried around by the user while traveling on foot, or it may be placed on a seat in a car. Additionally, the variability in values detected by the triaxial gyroscope 14, etc., needs to be taken into consideration. Accordingly, it is preferable to provide ***a triaxial compass 16 in order to detect the absolute orientation and utilize it in the dead-reckoning navigation***.

(*See* Nojima at ¶ [0018], *emphasis added*)

d. a device connected to a server;

438. I note that, in my opinion this claim element is indefinite because it is a means-plus-function term, and the '317 patent specification lacks a description of the structure for this element. However, to the extent that the Court's tentative construction is applied, or to the extent that the term is accorded it's plain and ordinary meaning, Nojima describes a device connected to a server using a wireless communications link, and this comports with either the Plaintiffs or the Court's constructions.

439. Nojima describes that the device can be connected via a cellular phone to various information sources, such as a road administration information center, or a transportation control center. For example:

> Furthermore, ***a road-information communication device 38*** for communicating with the Road Administration Information Center 100, and ***a public-transportation communication device 40*** for communicating with the Public Transportation Control Center 102 are ***connected to the communication control part 28***.
>
> (*See* Nojima at ¶ [0023], *emphasis added*)

440. A PHOSITA would understand that these centers would include computers or system that are capable of providing information to other devices, that is, servers.

441. In addition, to the extent that a local data storage facility may be considered to be a server, Nojima also discloses Map/Transportation System Database 18.

> The public-transportation communication device 40 obtains information such as a change in the diagram, etc. It should be noted that these communication devices may be used to obtain a variety of information to be stored in the ***map/transportation system database 18***. The communication control part 28 controls both communication devices so as to obtain the necessary information from an outside source.
>
> (*See* Nojima at [0023], *emphasis added*)
>
> I note that the

e. "a display"

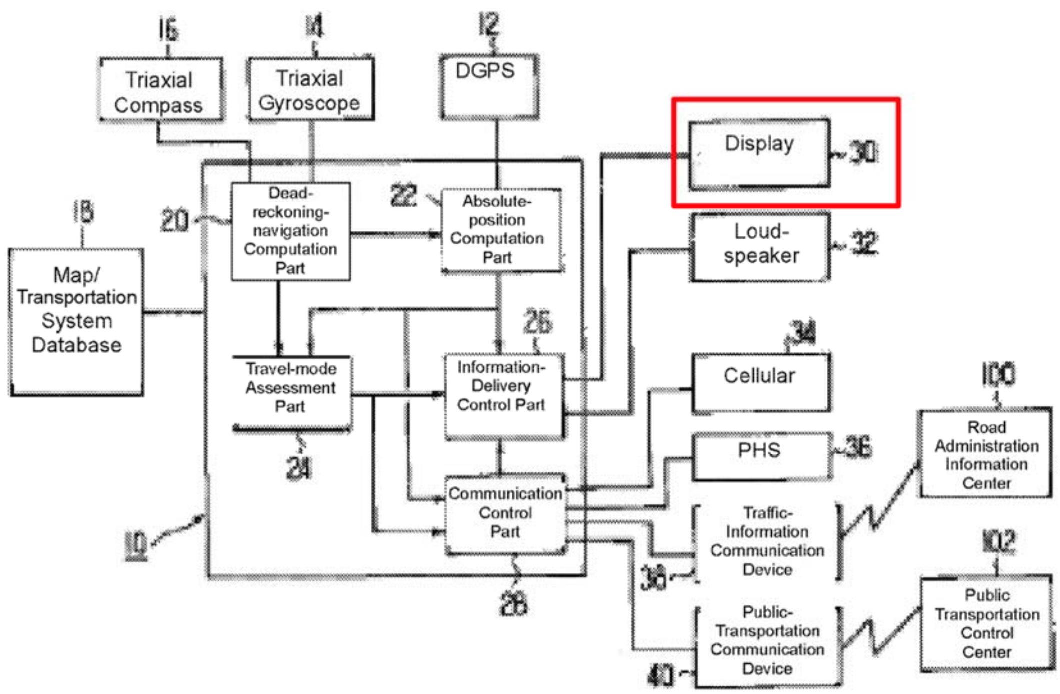
Nojima discloses a display unit 30 that is used to display maps and other information. For example:

> The information-display control part 26 creates the guidance information to be provided to the user through the use of the current position and the data in the map/transportation system database 18, whereupon it displays the information on the ***display unit 30*** and outputs it via the loudspeaker 32.
>
> (*See* Nojima at ¶ [0034], *emphasis added see also* FIG. 1)

> The ***display unit 30*** displays an enlarged map of the surrounding area of the current position and also a current-position mark. It also displays an indication of the address of the current position, a guide for the surrounding facilities, etc. The loudspeaker 32 outputs notification, such as, "You are at the district number OO of the Township of OO," or the like. In this way, the local information on the area around the current position is provided during travel on foot (Figure 3(a)).
>
> (*See* Nojima at ¶ [0035], *emphasis added*)

442. This display is also shown in Figure 1, reproduced below with annotation.

Figure 1



f. wherein said device connected to said server outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server

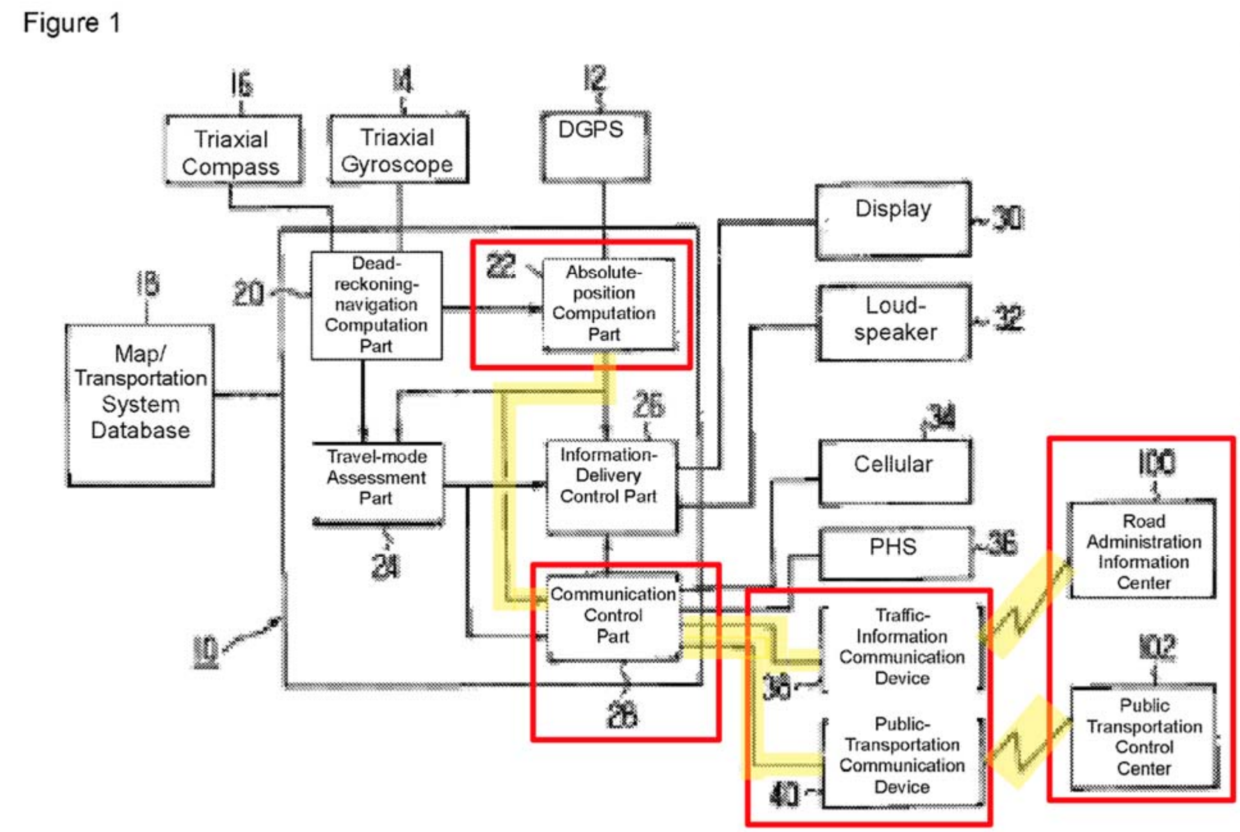
443. Nojima discloses that the mobile device outputs location information, and based on that information receives traffic information and public transport information. For example:

> Furthermore, a road-information communication device 38 for communicating with the Road Administration Information Center 100, and a public-transportation communication device 40 for communicating with the Public Transportation Control Center 102 are connected to the communication control part 28. ***The road-information communication device 38 obtains information that is useful for vehicle operations, for example,***

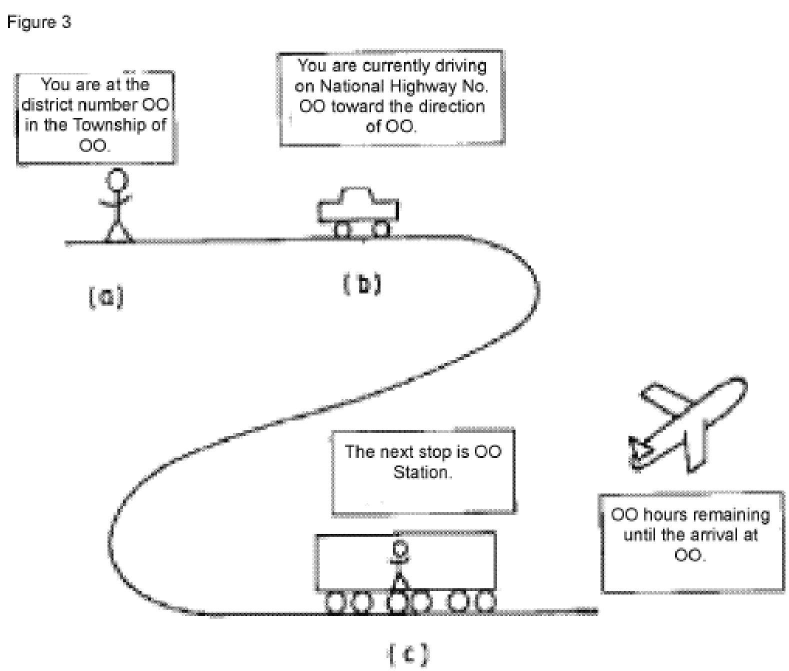
> ***during a traffic jam*. *The public-transportation communication device 40 obtains information such as a change in the diagram, etc***. It should be noted that these communication devices may be used to obtain a variety of information to be stored in the map/transportation system database 18. ***The communication control part 28 controls both communication devices so as to obtain the necessary information from an outside source.*** In this event, it controls the switchover of the communication device to be used, doing so in accordance with the travel mode currently being used by the user.
>
> (*See* Nojima at ¶ [0023], *emphasis added*)

444. To the extent that Nojima does not explicitly describe that location and direction information are sent to (outputted to) the server, this would be obvious to a PHOSITA. A PHOSITA would understand that in order to obtain, for example "*information that is useful for vehicle operations, for example, during a traffic jam*", from one of the identified servers, or, to, for example provide the information described in Figure 3, reproduced below, the mobile device would output its location and direction information to the server, and the server would retrieve information on the basis of this information. This can be further appreciated by the fact that Figure 1, reproduced with annotation below, illustrates the "absolute position computation part" 22 outputs location information to the communication control part" 28, which subsequently obtains information from one of the servers.

Scott Andrews Report on the invalidity of US Patent 6,748,317



Nojima FIG. 1 (Annotated)



Nojima FIG. 3

445. In addition, to the extent that the Map/Transportation System Database is considered a server, Nojima explicitly describes that information is retrieved on the basis of location information provided to the database. For example:

> The information-delivery control part 26 creates the guidance information to be provided to the user ***through the use of the current position and the data in the map/transportation system database 18, whereupon it displays the information on the display unit 30*** and outputs it via the loudspeaker 32. In this event, the contents of the guidance information are modified in accordance with the travel-mode discernment result, as follows:
>
> (*See* Nojima at ¶ [0034], *emphasis added*)

> A mobile terminal device, which has ***a current-position detection means and a map-information storage means so as to thereby provide information associated with the current position on the map*****,** said mobile terminal device being characterized by comprising:
>
> (*See* Nojima Claim 1, *emphasis added*)

446. In any event, a PHOSITA would find it obvious to retrieve road and other navigational information from a server by outputting a request containing location information (e.g. position and/or direction information), as this was, and remains a common approach to obtaining navigational information from a server, as described in the technology background of this declaration.

g. and said display displays said retrieved information"

447. Nojima describes that when the information-delivery control part 26 receives information, this information I then displayed on the display 30. For example:

> Furthermore, if the diagram-schedule delay information is created in the step S30, such information ***will also be sent to the information-delivery control part 26***.
>
> (*See* Nojima at ¶ [0033], *emphasis added*)

> The information-delivery control part 26 creates the guidance information to be provided to the user through the use of the current position and the data in the map/transportation system database 18, whereupon ***it displays the information on the display unit 30*** and outputs it via the loudspeaker 32.
>
> (*See* Nojima at ¶ [0034], *emphasis added*)

> The communication control part 28 further controls the switching between the road-information communication device 38 and the public-transportation communication device 40 according to the mode of travel. It uses the road-information communication device 38 for communication while the user is traveling by car, but it uses the public-transportation communication device 40 for communication while the user is using a form of public transportation. It uses neither of the communication devices while the user is traveling on foot. And, ***the information thus obtained is sent to the information-delivery control part 26, whereupon it is displayed on the display unit 30*** and announced via the loudspeaker 32, when appropriate.
>
> (*See* Nojima at ¶ [0039], *emphasis added*)

ii. Claim 7

a. A portable terminal according to claim 6, wherein said information is stores or roads information

448. Claim 7 depends from Claim 6 and adds the further limitation "wherein said information is stores or roads information".

449. Nojima describes that the information provided by the various servers may include road information or information about local facilities. For example:

> Examples of the travel mode data include data such as ***road geometry***, geometry of roads dedicated of cars, railroad train route geometry, names of train routes, positions of train stations, timetables, airline routes, sailing routes, pedestrian roads, etc.
>
> (*See* Nojima at ¶ [0009], *emphasis added*)

> And, the map/transportation system database 18 stores data, such as a national map (***including road information***), address designations, the names of intersections, etc. Furthermore, the map/transportation system database 18 also stores data on public transportation, such as railroad trains, including, for example, the ***route maps, locations of stations, station names and diagrams (timetables)***, etc.
>
> (*See* Nojima at ¶ [0017], *emphasis added*)

> (1) 'Travel on foot': The display unit 30 displays an enlarged map of the surrounding area of the current position and also a current-position mark. ***It also displays an indication of the address of the current position, a guide for the surrounding facilities***, etc.
>
> (*See* Nojima at ¶ [0035], *emphasis added*)

450. A PHOSITA would understand that "surrounding facilities" would include facilities such as stores.

iii. Claim 8

a. A portable terminal according to claim 6, wherein said display displays said retrieved information as lists

451. Claim 8 depends from Claim 6 and adds the further limitation "wherein said display displays said retrieved information as lists".

452. Nojima describes that some information retrieved from the servers would be displayed in the form of lists. For example:

> And, the map/transportation system database 18 stores data, such as a national map (***including road information***), address designations, the names of intersections, etc. Furthermore, the map/transportation system database 18 also stores data on public transportation, such as railroad trains, including, for example, the ***route maps, locations of stations, station names and diagrams (timetables)***, etc.
>
> (*See* Nojima at ¶ [0017], *emphasis added*)

> (3) Public transportation: The display unit 30 displays a route map. As appropriate, the route map also shows the station names and ***the respective durations up to the last stop as well as the connection/transit information***. A current-position mark is also displayed on the route. Furthermore, the display nit 30 also displays the ***diagram-schedule delay information*** created in the step S30 shown in Figure 2.
>
> (*See* Nojima at ¶ [0037], *emphasis added*)

A PHOSITA would understand that a timetable is a type of list.

H. Claims 6-8 of the '317 Patent are rendered obvious by Behr in combination with Bertrand

i. Summary

453. In my opinion Behr in combination with Bertrand renders obvious claims 6-8 of the ‘317 patent. In the sections below I have laid out the basis for my opinion for the various claim elements.

ii. Claim 6

a. “A portable terminal, comprising”

454. Behr describes a mobile terminal device that generates queries to a base station to request routes and other location based information. The mobile device is characterized, for example as a laptop computer or a personal digital assistant (PDA), i.e. handheld portable computer. For example:

> There is a further need for a routing and information system which can be implemented on ***lightweight, portable devices*** for easy, convenient transportation and use.
>
> (*See* Behr, col. 2, lines 33-36, *emphasis added*)

> The invention provides a system and method for providing geographically referenced information from a base unit or server to a mobile unit. ***The mobile unit may be a transportable device such as a laptop computer or personal digital assistant (PDA)***
>
> (*See* Behr, col. 3, lines 43-48, *emphasis added*)

> Another remote unit may also be mobile or transportable, such as laptop personal computer 18 or pager 20. As used herein, the term "mobile unit" includes both remote units which may be permanently located at a single site or remote units which are mobile or transportable.
>
> (*See* Behr, col. 6, lines 8-13)

455. Behr illustrates this mobile (portable) device in Figure 1, reproduced with annotation below.

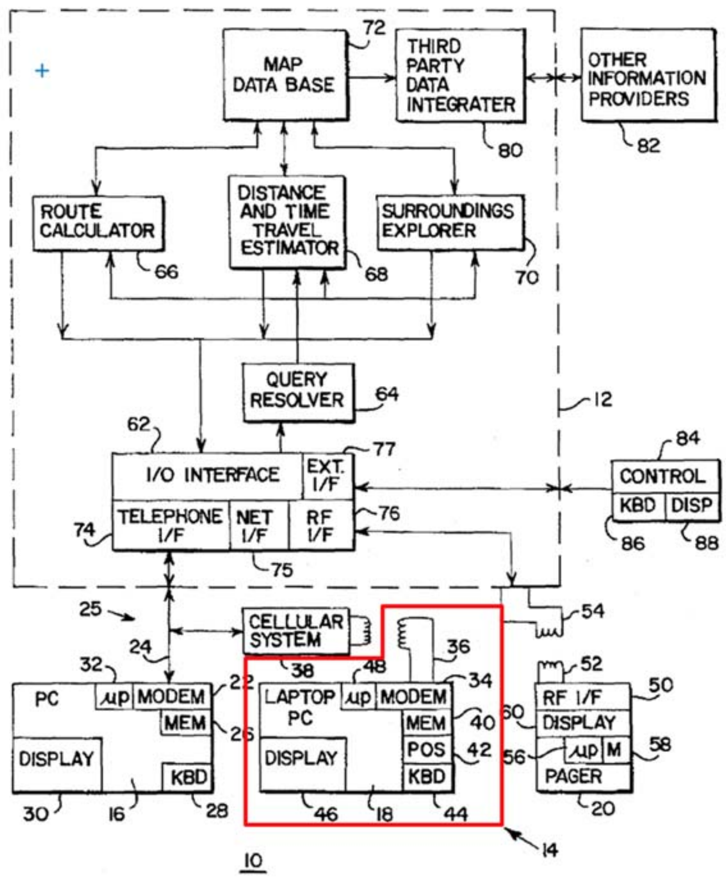


FIG. 1

Behr FIG. 1 *Annotated*

Bertrand describes digital map reader, that is portable. For example.

> A ***Portable*** Digital Map Reader
> (*See* Bertrand at Title, , *emphasis added*)

> Advantageously, the device of the invention is powered in self-contained manner by batteries that are rechargeable or otherwise, and it is ***portable***.
>
> (*See* Behr, col. 2, lines 12-14, *emphasis added*)

> A conventional format for the device of the invention may be one of the formats A4 and A5, however any dimensions are possible providing the display is readable and the device is not too heavy for a device that is self-contained and ***portable***.
>
> (*See* Behr, col. 4, lines 18-22, *emphasis added*)

b. "a device for getting a location information denoting a present place of said portable terminal"

456. Behr discloses a device for getting location information denoting a present place of said portable terminal. Specifically, Behr discloses that the mobile device 14 includes position determination functionality, and describes this capability as being implemented using GPS, LORAN or other similar positioning systems. For example:

> The positioning sensors may ***determine geographic position*** from RF (Radio Frequency) triangulation or in response to signals from, for example, ***GPS (Global Positioning System), LORAN C or other similar positioning systems***, and from motion and direction detectors.
>
> (*See* Behr, col. 1, lines 33-37, *emphasis added*)

> The laptop personal computer 18 is another example of a mobile unit which may be used in the system 10. The laptop PC 18 includes a modem 34, a memory 40, **a *position locator 42***, a keyboard 44, a display 46 and a microprocessor 48.

(*See* Behr, col. 6, lines 51-54, *emphasis added*)

The position locator 42 provides the geographical position of the laptop PC 18. For example, the position indicator 42 may perform RF (radio frequency) triangulation or ***may be responsive to GPS (Global Positioning System), LORAN C signals or other satellite positioning systems for providing latitude and longitude positioning information***. *The* ***position locator 42 thus provides a position determining means for determining the geographical position of the mobile unit***.

(*See* Behr, col. 6, line 63 to col. 7, line 4, *emphasis added*)

Behr illustrates this positioning structure in Figure 1, reproduced with annotation below.

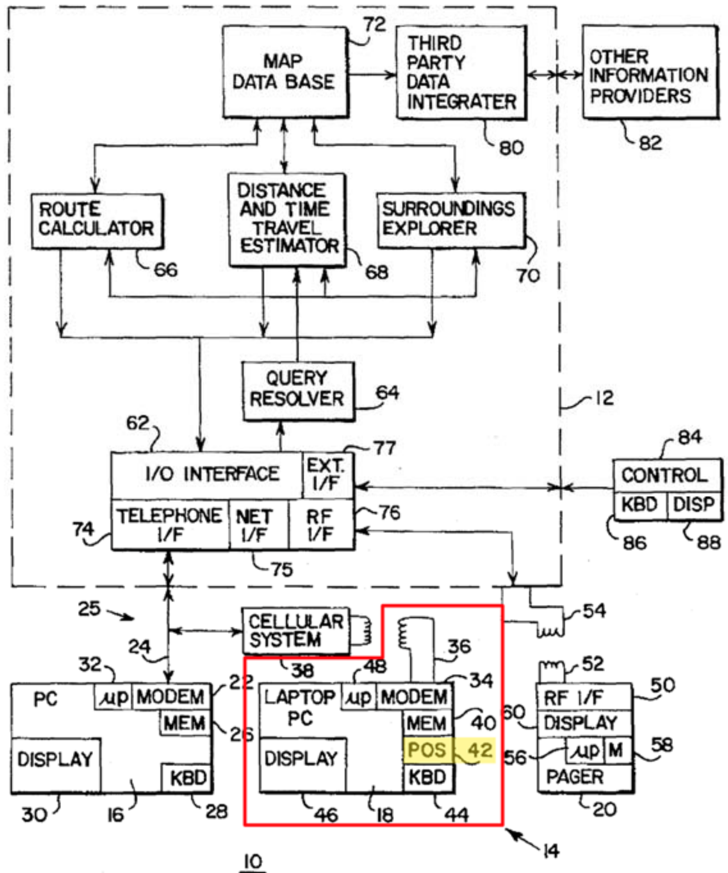


FIG. 1

Behr FIG. 1 *annotated*

457. Bertrand describes a positioning system as part of the portable digital map reader. For example:

> It is of interest to observe that the power of the self-contained portable reader can be reinforced by adding ***a global positioning system (GPS) module to enable positioning to be determined***
>
> (*See* Bertrand, col. 6, lines 55-58, *emphasis added*)

> Systems for navigation and for providing assistance in car driving are known that calculate the ***position of a vehicle relative to a digital road map background***.
>
> (*See* Bertrand, col. 1, lines 28-30, *emphasis added*)

458. In the event that the Board determines this limitation is governed by 35 U.S.C. § 112(6). Behr and Bertrand disclose the function of getting a location information of the portable terminal; Behr and Bertrand also disclose structures that perform the specified function, including a GPS receiver or equivalent hardware, software

c. "a device for getting direction information denoting an orientation of said portable terminal"

459. Behr a direction detector. For example:

> The positioning sensors may determine geographic position from RF (Radio Frequency) triangulation or in response to signals from, for example, GPS (Global Positioning System), LORAN C or other similar positioning systems, and from ***motion and direction detectors***.
>
> (*See* Behr, col. 1, lines 33-37, *emphasis added*)

460. Bertrand discloses a compass which is used to determine the orientation of the device relative to north. For example:

> …the appliance being characterized in that it further ***includes a compass adapted to measure the angle between the orientation of the appliance and magnetic north, and to send corresponding information to the central unit,*** said central unit

> responding to said information by issuing a corresponding order to the screen display process 60 to cause the displayed image to be oriented as a function of said information. "
>
> (*See* Bertrand, col 1, lines 55-62, *partial excerpt emphasis added*)

> "Special interfaces provide a connection with the various elements of the device: ***a measurement interface 28 for controlling a compass 45…***
>
> (*See* Bertrand, col 3, lines 20-23, *partial excerpt, emphasis added*)

> The central processor unit 19 comprises, in particular, one or more processors (for calculation, optimization, topological simulation, compression, etc. ....), together with a time base enabling date and time to be displayed and enabling travel times to be computed. It cooperates with the ***compass 45 that makes it possible to measure the angle between the orientation of the appliance and magnetic north***.
>
> (*See* Bertrand, col. 3, lines 56-67, *emphasis added*)

> "…***the appliance further including a compass for measuring the angle between the vertical axis of said display screen and magnetic north.***"
>
> (*See* Behr, col. 7, lines 8-10, *partial excerpt, emphasis added*)

461. The compass is also illustrated as item 45 in Figure 5 of Bertrand, reproduced below.

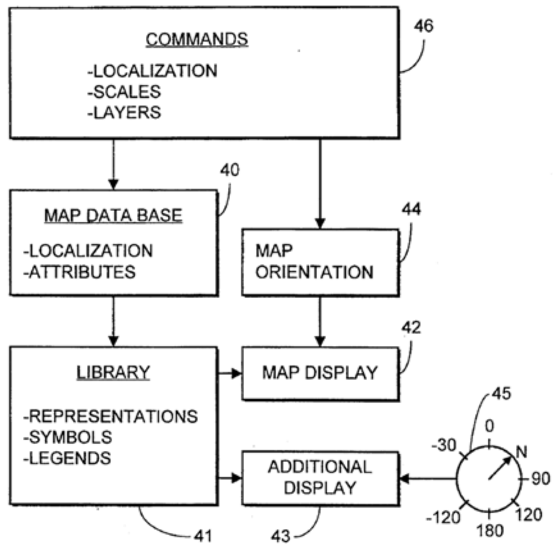


FIG. 5

Bertrand FIG. 5

462. To the extent that Behr's "direction detector "is found not to disclose sufficient function or structure for "getting direction information denoting an orientation of said portable terminal", it would be obvious to include a structure such as the compass of Bertrand in the mobile device of Behr. The motivations for such a combination are provided at the end of this section. In such a combination, each device (the mobile device of Behr, and the compass of Bertrand) would be performing the same function as in their original applications. The compass of Bertrand would simply serve as the direction detector identified by Behr, and would thus allow the mobile device of Behr to include direction in its queries. This would produce the predictable result of expanding the range of information

provided by the base station, for example by providing point of interest queries based on the direction the device is pointing. This would be particularly useful when the user was using a PDA mobile device as described by Behr, since the PDA device would be handheld, and the user would be able to easily move in different directions, and thus the information retrieved from the base station would be more dependent on the immediate orientation of the device.

d. a device connected to a server;

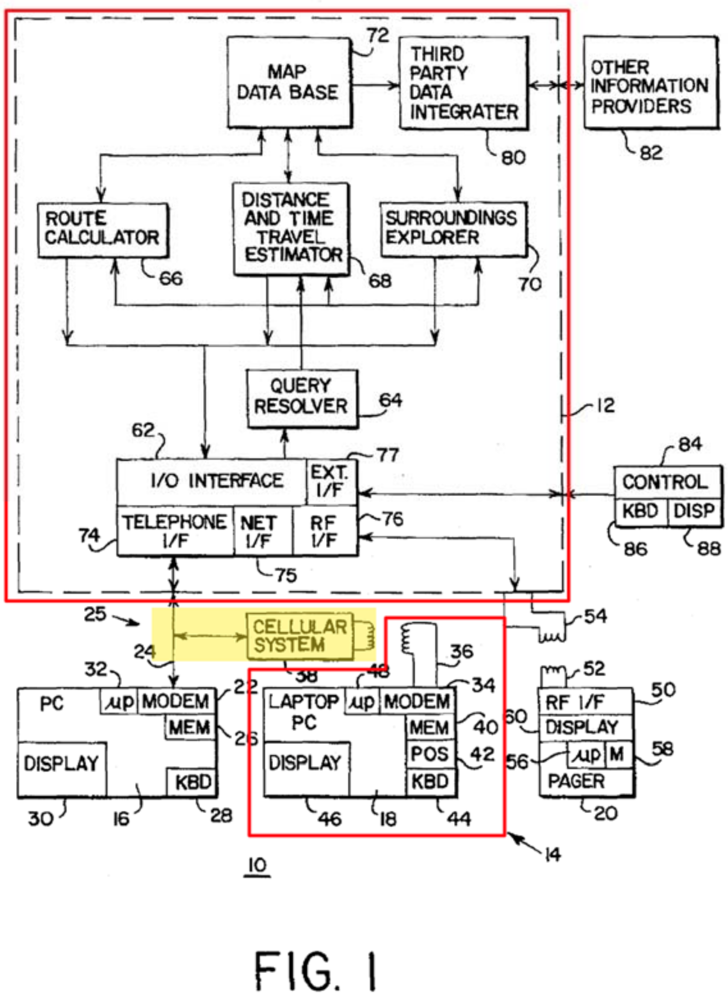
463. Behr explicitly describes that the mobile device is connected to a server so that it may obtain location based information. For example:

> As can be seen from the foregoing, the invention provides a system and method for ***providing graphically referenced information from a base unit or server to a mobile unit***.
>
> (*See* Behr, col. 15, lines 56-58, *emphasis added*)

> The ***base unit further includes a server for receiving queries from one or more mobile units***, resolving ambiguities in the queries, determining a response to the query, accessing the geographical database as needed. ***The server formats a response to the query and communicates the response to the mobile unit.***
>
> (*See* Behr, col. 4, lines 14-19, *emphasis added*)

> The invention provides a system and method for ***providing geographically referenced information from a base unit or server to a mobile unit***. The mobile unit may be a transportable device such as a laptop computer or personal digital assistant (PDA)
>
> (*See* Behr, col. 3, lines 44-48, *emphasis added*)

464. Behr illustrates the connection to the server in Figure 1, reproduced below with annotation to identify this connection, which is made by modem 34 in the portable device, cellular system 38, and the I/O interface 62 together with its associated components.



Behr FIG. 1 *annotated*

465. Bertrand discloses that the device includes connectors for connecting, among other things, to networks and other computers. For example:

> The ***input/output connectors and sockets*** serve, in addition to the connections mentioned above, for **providing connections with** peripherals (a printer, a plotter, an external screen, a television set, a scanner, a digital camera, a video camera, etc. . . .), ***with networks, with other computers,*** or indeed with other digital map readers.
>
> (*See* Bertrand, col. 3, lines 50-55 *emphasis added*)

466. A PHOSITA would understand that the "other computers" would be servers that could be connected via "networks".

467. I note that, in my opinion this claim element is indefinite because it is a means-plus-function term, and the '317 patent specification lacks a description of the structure for this element. However, to the extent that the Court's tentative construction is applied, or to the extent that the term is accorded it's plain and ordinary meaning, Behr describes a device connected to a server using a wireless communications link, and this comports with either the Plaintiffs or the Court's constructions.

e. "a display"

468. Behr describes that the mobile device includes a display that may be graphical or textual. For example:

> The ***display may be a graphical display***, showing map portions and providing travel directions along with a display of highway signs and other information. ***The display may be textual information, providing travel directions***. The mobile unit may

> supply a digitally synthesized voice which audibly presents the travel directions to the user.
>
> (*See* Behr, col. 4, lines 29-34, *emphasis added*)

> The mobile unit may be a transportable device such as a laptop computer or ***personal digital assistant (PDA)****,* or may be a desktop personal computer or ***any other device permitting*** data entry and ***display*** or printing of the provided information.
>
> (*See* Behr, col. 3, lines 46-50, *emphasis added*)

> It is therefore an advantage of the invention to provide a method and apparatus for providing geographically referenced information from a base unit to a mobile unit, the ***mobile unit including only data entry and display devices*** and a communications link.
>
> (*See* Behr, col 4, line 65 to col. 5, line 2, *emphasis added*)

> ***The response to the request is displayed on the display 30. The display 30 thus forms an output means at the mobile unit*** for providing an indication of the route provided in the response. In addition, the response may be stored in the memory 26 for later retrieval and display. The memory 26 thus provides storage means at the mobile unit for storing the 50 route communicated from the base unit.
>
> (*See* Behr, col. 6, lines 43-50, *emphasis added*)

469. The display is illustrated by Behr in Figure 1, reproduced with annotation identifying the display below.

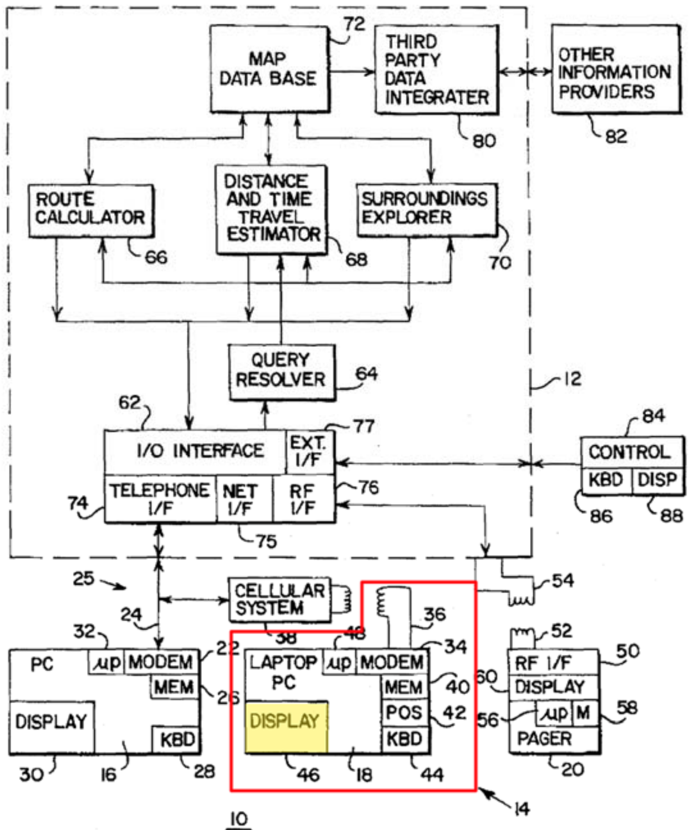


FIG. 1

Behr FIG. 1 *annotated*

470. Bertrand describes two display screens, as illustrated in Figure 1, reproduced below.

> FIG. 1 shows a **two-*screen digital map reader*** of the invention made up of ***two portions each having its own screen***, which portions may be separated and assembled together by snap-fastening. The lefthand portion contains a battery 1, an electrical power supply circuit 2, a plurality of input/output connectors and sockets, in particular for an audio headset 16, an optical reader 4, a magnetic recorder and reader 5, a loudspeaker 6, a control keypad 7, and a fiat screen 8.
>
> (*See* Bertrand, col. 2, lines 55-64, *emphasis added*)

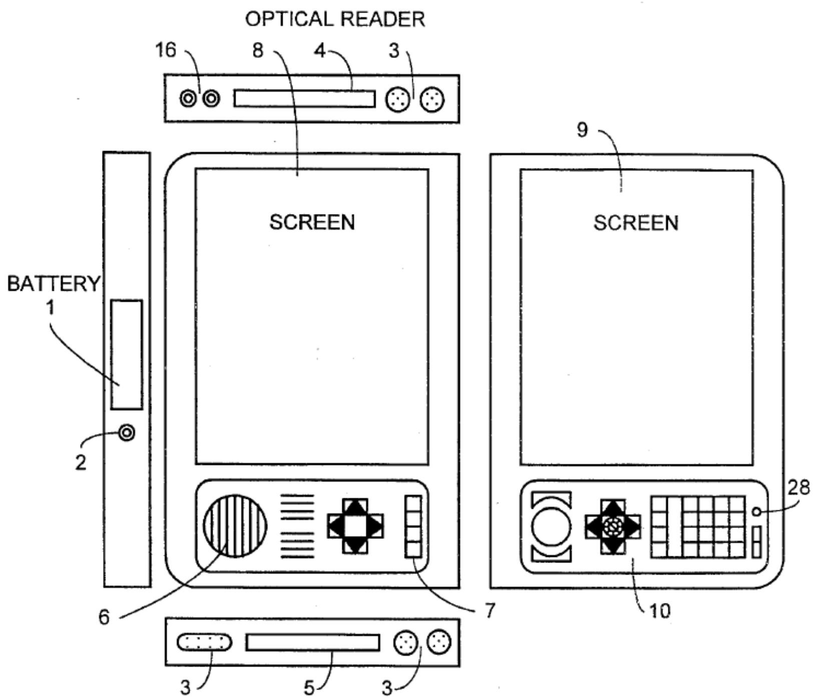


FIG. 1

Bertrand FIG. 1

The invention relates to an appliance for reading digital geographical maps, in particular topographical or road maps, recorded on magnetic or optical media, the appliance comprising in conventional manner a central processor unit (19), means (4, 5) for reading magnetic or optical media, at least one ***display screen (8, 9),*** control means (7, 10), and electrical power supply means.

(*See* Bertrand at Abstract, *emphasis added*)

Bertrand also shows these screens (items 8 and 9) in FIG. 3, reproduced below.

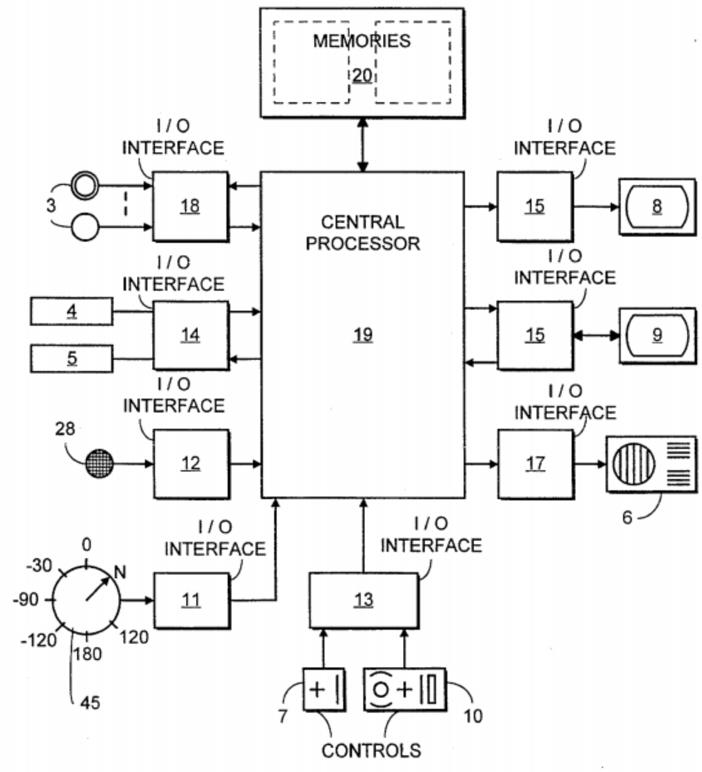


FIG. 3

Bertrand FIG. 3

f. "wherein said device connected to said server outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server

471. Behr provides an extensive description of functionality and structure that performs this claim limitation.

472. Behr discloses a "device connected to said server outputting said location information and said direction information". For example:

> ***The origin and destination are communicated from the mobile unit to the base unit***. The base unit calculates a route between the specified origin and destination. The routing information is

> communicated from the base unit to the mobile unit where it is displayed by the mobile unit.
>
> (*See* Behr, col. 4, lines 24-29, *emphasis added*)

> The microprocessor 32 responds to program instructions and data stored in the memory 26. To activate the system 10, a user manipulates the keyboard 28 to ***formulate a request. The request may, for example, seek the route between an origin and a destination***.
>
> (*See* Behr, col. 6, lines 33-38, *emphasis added*)

> …a query is formatted at the remote unit. The query is formatted in accordance with the protocol of the invention, to be described in further detail in conjunction with FIG. 3. The query comprises a serial stream of data and control bits. The control bits, for example, identify the remote user originating the query. ***The data bits specify the precise request being made of the base unit. For example, the data bits may specify an origin point and a destination point, from which the route calculator 66 (FIG. 1) of the base unit 12 is to calculate the route***.
>
> (*See* Behr, col. 10, lines 17-28*, partial excerpt, emphasis added*)

> The laptop PC 18, in response to the program instructions stored in the memory 40, provides a request over the commercial telephone system to the base unit 12. ***The request may be, for example, for the route between an origin and a destination.*** The origin may be specified either by manipulating the keyboard 44 or by ***providing the latitude and longitude information produced by the position locator 42***. The base unit 12 provides a response to the request to the laptop PC 18. The response is displayed on the display 46.
>
> (*See* Behr, col. 7, lines 4-13, *emphasis added*)
>
> Behr at 7:4-13

473. Behr also describes, in detail, the structure of a typical query, indicating in Figure 3, reproduced with annotation below, that the query includes location information. As described in the citations above, this query is communicated (i.e. "outputted") to the base station server. For example:

> ***The query message 120 further includes a latitude field 136 and a longitude field 138. These fields specify the current position of the mobile unit latitude and longitude, respectively. By default, the current latitude and longitude provide the origin for all routing requests, and also provide the position used for default tracking address translation.***
>
> The query message 120 further ***includes an origin field 140. The origin field 140 specifies the origin address for a routing information request. If this field is empty, the current position specified by the latitude field 136 and the longitude field 138 is used as the origin address***.
>
> The query message 120 further includes an ***origin type field 142, which may be either an address or a point of interest category (such as "restaurant," "museum" or "airport")*** which is recognizable by the base unit 12.
>
> The query message 120 further ***includes a destination field 144, which specifies the destination address if routing information is requested by the mobile unit from the base unit 12***. If the destination field 144 is empty, then no route is calculated by the base unit 12. Instead, the message 120 is considered to be a tracking message only, merely providing the location of the mobile unit.
>
> (*See* Behr, col. 12, lines 37-67, *emphasis added*)

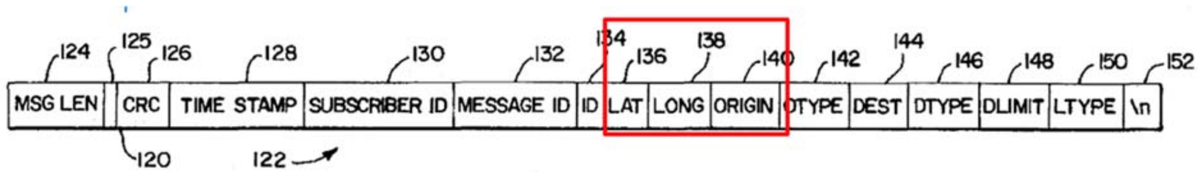


FIG. 3

Behr FIG. 3 annotated

474. Behr also describes that the query may be for a point of interest, which may include museums, restaurants, etc.

> The query message 120 further ***includes a destination type field 146 which specifies the type of destination***. For example, the destination may be an address or a point of interest category recognizable by the base unit 12. ***For example, the point of interest categories may include "restaurants", "airport", or "museum." As one example, the destination type field 146 may be "restaurant,"*** and the destination field 144 may be "McDonald'sTM"
>
> (*See* Behr, col. 12, 60-67, *emphasis added*)

> ***If the query requests information about points of interest in the area surrounding an origin***, the query is conveyed to the surroundings explorer 70. The surroundings explorer 70 preferably provides an optimized method for searching for points of interest satisfying specified criteria or parameters such as time or distance. For example, the surroundings explorer 70 may locate all McDonald'sTM restaurants within a specified driving distance or driving time of a specified origin, or it may locate the McDonald'sTM restaurant nearest the specified origin.
>
> (*See* Behr, col. 9, lines 22-32, *emphasis added*)

> ***A route query asks the base unit 12 to identify a route between a specified origin point and a specified destination point***. A

> route query includes the origin and the destination. A point of interest query requests a list of points of interest which satisfy specified criteria. For example, a point of interest query might request a list of all restaurants of a specific type, such as McDonald'sTM, ***within a specified distance or a specified 55 driving time of a specified origin***.
>
> (*See* Behr, col. 10, lines 49-55, *emphasis added*)

475. Behr also discloses "receiving retrieved information based on said outputted information at said server." Specifically, Behr describes that the base station responds to the query by providing information from its geographic database, for example routing, points of interest or other roadway specific information.

> The origin and destination are communicated from the mobile unit to the base unit. The base unit calculates a route between the specified origin and destination**. *The routing information is communicated from the base unit to the mobile unit where it is displayed by the mobile unit.***
>
> (*See* Behr, col. 4, lines 24-29, *emphasis added*)

> If the query requested calculation of a route between an origin and a destination, the query is routed to the route calculator 66. In a manner well known in the art, ***the route calculator 66 determines a route between a specified origin and destination using the map database 72***
>
> (*See* Behr, col. 8, lines 48-52, *emphasis added*)

> After a route has been calculated, ***the route is conveyed from the route calculator 66 to the I/O interface 62***. ***The I/O interface 62 formats a response to the query***. The response includes the route guidance information determined by the

route calculator 66. The I/O interface 62 then communicates the response from the base unit 12 to the mobile unit which originally requested the information.

(*See* Behr, col. 9, lines 6-12, *emphasis added*)

If the query requests information about points of interest in the area surrounding an origin, the query is conveyed to the surroundings explorer 70. The surroundings explorer 70 preferably provides an optimized method for searching for points of interest satisfying specified criteria or parameters such as time or distance. For example, the ***surroundings explorer 70 may locate all McDonald'sTM restaurants within a specified driving distance or driving time of a specified origin, or it may locate the McDonald's TM restaurant nearest the specified origin.***

(*See* Behr, col. 9, lines 22-32, *emphasis added*)

Behr at 9:22-32

…a query is formatted at the remote unit. The query is formatted in accordance with the protocol of the invention, to be described in further detail in conjunction with FIG. 3. The query comprises a serial stream of data and control bits. The control bits, for example, identify the remote user originating the query. The data bits specify the precise request being made of the base unit. ***For example, the data bits may specify an origin point and a destination point, from which the route calculator 66 (FIG. 1) of the base unit 12 is to calculate the route***.

(*See* Behr, col. 10, lines 17-28, *partial excerpt, emphasis added*)

The method continues at step 114, where the query is 5 fulfilled. For example, ***if the query requested routing information between an origin and a destination, the route calculator 66, operating in conjunction with the map database 72, calculates a route between the origin and the destination. Similarly, if the query was a point of interest 10 query, the surroundings***

> ***explorer 70 will determine points of interest which satisfy the query***.
>
> (*See* Behr, col. 11, lines 5-12, *emphasis added*)

g. and said display displays said retrieved information"

476. Behr describes that the mobile unit displays the information retrieved from the server. This information may include route information, specific intersection information, street sign information or points of interest information. For example:

> The origin and destination are communicated from the mobile unit to the base unit. The base unit calculates a route between the specified origin and destination. The **routing information is communicated from the base unit to *the mobile unit where it is displayed by the mobile unit***.
>
> (*See* Behr, col. 4, lines 24-29, *emphasis added*)

> ***The response to the request is displayed on the display 30. The display 30 thus forms an output means at the mobile unit for providing an indication of the route provided in the response***. In addition, the response may be stored in the memory 26 for later retrieval and display.
>
> (*See* Behr, col. 6, lines 43-48, *emphasis added*)

> Further in accordance with the invention, ***the response transmitted from the base unit 12 to a mobile unit may include maneuver arms information. Maneuver arms are graphical vectors used by the mobile unit for displaying a graphical representation of an intersection to be traversed***. Three types of visual information are transmitted by the base unit. ***These include a geometric representation of the intersection, including vectors defining the streets approaching an intersection and the angles at which the streets approach the intersection***. The transmitted information further i***ncludes which***

> ***of the streets is included in the route to be travelled so that, for example, that street may be highlighted in a graphical display***. *The* ***transmitted information further includes information about street signs located at the intersection***.
>
> (*See* Behr, col. 13, line 64 to col. 14, line 11, *emphasis added*)

iii. Claim 7

a. "A portable terminal according to claim 6, wherein said information is stores or roads information"

477. Claim 7 depends form Claim 6 and adds the further limitation "wherein said information is stores or roads information"

478. As described above, Behr in combination with Bertrand renders Claim 6 obvious.

479. Behr describes that the base station responds to the query by providing information from its geographic database, for example routing, points of interest or other roadway specific information:

> Further in accordance with the invention, ***the response transmitted from the base unit 12 to a mobile unit may include maneuver arms information. Maneuver arms are graphical vectors used by the mobile unit for displaying a graphical representation of an intersection to be traversed***. Three types of visual information are transmitted by the base unit. ***These include a geometric representation of the intersection, including vectors defining the streets approaching an intersection and the angles at which the streets approach the intersection***. The transmitted information further ***includes which of the streets is included in the route to be travelled so that, for example, that street may be highlighted in a graphical display***. The transmitted information further ***includes information about street signs located at the intersection.***

> (*See* Behr, col. 13, line 64 to col. 14, line 11, *emphasis added*)

480. A PHOSITA would understand that representations of intersections, route information, street names and street signs are all examples of "roads information".

481. In addition, Behr describes several examples of point of interest information. A PHOSITA would understand that "points of interest" include specific types of destinations, for example museums and other public places, restaurants, shopping centers, etc. A PHOSITA would also understand that a restaurant is a type of store.

> The geographic database is a representation of a region or metropolitan area and may include, for example, **street names**, navigation attributes, such as tum restrictions and one-way streets, street addresses, and ***points of interest, such as airports, restaurants and museums***.
>
> (*See* Behr, col. 1, lines 29-32, *emphasis added*)

> If the query requests information about ***points of interest in the area surrounding an origin***, the query is conveyed to the surroundings explorer 70. The surroundings explorer 70 preferably provides an optimized method for searching for points of interest satisfying specified criteria or parameters such as time or distance. For example, the ***surroundings explorer 70 may locate all McDonald'sTM restaurants within a specified driving distance or driving time of a specified origin, or it may locate the McDonald's TM restaurant nearest the specified origin.***
>
> (*See* Behr, col. 9, lines 22-32, *emphasis added*)

> The method continues at step 114, where the query is 5 fulfilled. For example, if the query requested routing information between an origin and a destination, the route calculator 66, operating in

> conjunction with the map database 72, calculates a route between the origin and the destination. Similarly, **if the query was a point of interest 10 query, the surroundings explorer 70 will determine points of interest which satisfy the query**."
>
> (*See* Behr, col. 11, lines 5-12, *emphasis added*)

iv. Claim 8

a. "A portable terminal according to claim 6, wherein said display displays said retrieved information as lists"

482. Claim 8 depends form Claim 6 and adds the further limitation "wherein said display displays said retrieved information as lists"

483. As described above, Behr in combination with Bertrand renders Claim 6 obvious.

484. Behr also explicitly identifies information that is displayed in the form of various types of list. For example:

> A point of interest query requests a list of points of interest which satisfy specified criteria. For example, a point of interest query **might request a list of all restaurants of a specific type, such as McDonald'sTM**, within a specified distance or a specified driving time of a specified origin. A language query requests a list of available languages for display of information at the mobile unit or specifies the language (such as English or Dutch) in which the routing information is to be displayed at the remote unit. ***A metro area query requests a list of available metropolitan areas or specifies the metropolitan area within the map database 72 (FIG. 1) to be used for responding to the query.***
>
> (*See* Behr, col. 10, lines 50-62, *emphasis added*)

> Still further, the message 120 could ***optionally request additional information from the base unit 12, such as a list of point of interest types, a list of points of interest matching search criteria or a list of files*** which may be communicated from the base unit 12 to the mobile unit to provide descriptive information.
>
> (*See* Behr, col. 13, lines 39-45, *emphasis added*)]

v. The Combination of Behr and Bertrand

485. A PHOSITA would find it obvious to combine the teachings of Behr with those of Bertrand. First, both Behr and Bertrand describe portable systems for displaying detailed map information from map databases, based on the location of the device. For example:

> There is a further need for a routing and information system which can be implemented on ***lightweight, portable devices*** for easy, convenient transportation and use.
>
> (*See* Behr, col. 2 lines 33-36, *emphasis added*)

> The invention provides a system and method for providing geographically referenced information from a base unit or server to a mobile unit. ***The mobile unit may be a transportable device such as a laptop computer or personal digital assistant (PDA)***
>
> (*See* Behr, col. 3, lines 43-48, *emphasis added*)

> The base unit includes a geographical database, such as the Navigation Technologies Corp navigable map database. ***The geographical database stores a variety of geographical and position-oriented attributes***, such as street addresses, turn restrictions and ***points of interest***. The points of interest are preferably organized according to different parameters, including point of interest type, such as "restaurant" or "museum;" point of interest name; city…"

> (*See* Behr, col. 4, lines 6-13, *emphasis added*)
>
> It has thus been observed that the device of the invention has multiple advantages: because it is self-contained it can be used equally well in the office, at home, in a vehicle, and **in *association with any kind of displacement (walking, cycling, sailing, horseriding, etc ....***)
>
> (*See* Bertrand, col. 6, lines 32-36, *partial excerpt*, *emphasis added*)
>
> The basic functions of the device (displaying map, guidebooks, optimizing and tracking routes, diary, directory) may be associated with additional functions that are specific to professional or recreational activities. ***The very large storage capacity of optical or magnetic*** systems makes it possible to store a very full amount of information: ***hotels, restaurants, bars, service stations and garages, police services; medical services, tourist information, or professional information of any kind***, train and air timetables, FM frequencies, useful telephone numbers, etc.
>
> (*See* Bertrand, col. 4, lines 28-37, *emphasis added*)

486. In addition, both Behr and Bertrand obtain points of interest in the local area of the device from a map database, and both systems subsequently display these points of interest. For example:

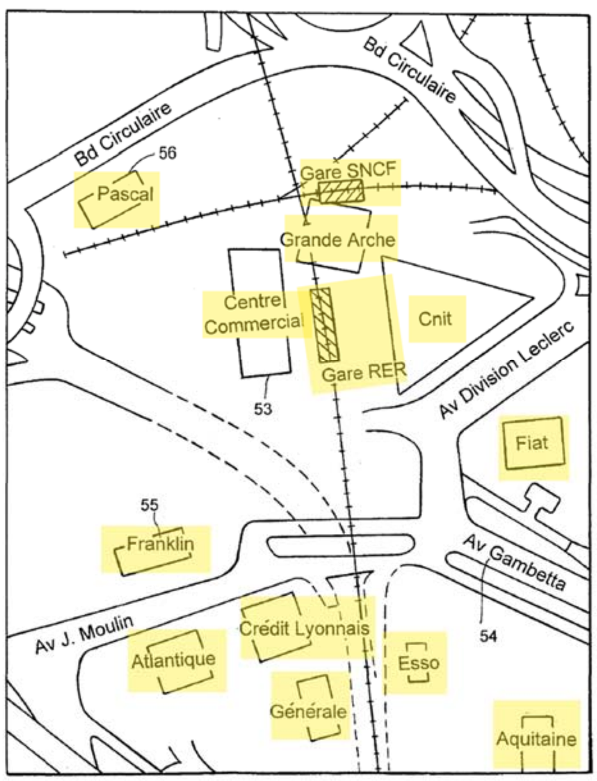
> In a second mode of operation, the mobile unit formulates a query ***requesting information about points of interest within a specified distance of an origin.*** The origin may be specified by street address, intersecting streets, by geographic position or by reference to a point of interest. The query is communicated from the mobile unit to the base unit. The base unit uses the geographical database to formulate a response. ***The response is***

> ***communicated from the base unit to the mobile unit for display to the user.***
>
> (*See* Behr, col. 4, lines 36-44, *emphasis added*)

> …because of its power it provides access that is quick, easy, and interactive with data that is very fine and varied. ***It is particularly useful because of its "guidebook" function***, since present guidebooks on paper are very poor due to reasons of bulk and are incapable of dynamically linking texts and maps.
>
> (*See* Bertrand, col. 6, lines 36-41, *partial excerpt*, *emphasis added*)

487. Bertrand illustrates this display of points of interest in Figure 8, reproduced with the points of interest highlighted, below.

F I G. 8



Bertrand FIG. 8 *annotated*

488. Thus, a skilled artisan seeking to improve Behr's display of geographical information, for example, points of interest, would be motivated to seek out a reference such as Bertrand, which also displays this type of information.

489. Behr acknowledges that prior art systems of this type include direction sensors (see e.g., 1:36-37), thus a PHOSITA reading Behr would understand the need for including direction together with position in retrieving geographic data from the database, and they would be taught by Bertrand how to implement this function through the addition of a compass.

I. Claims 1-3, 15-17, and 20 of the '317 Patent are Rendered Obvious by Ohmura in Combination with Colley

490. In my opinion Ohmura in combination with Colley renders obvious Claims 1-3, 15-17, and 20 of the '317 patent. In the sections below I have laid out the basis for my opinion for the various claim elements.

i. Claim 1

491. Claim 1 is an independent claim.

a. A portable terminal, comprising

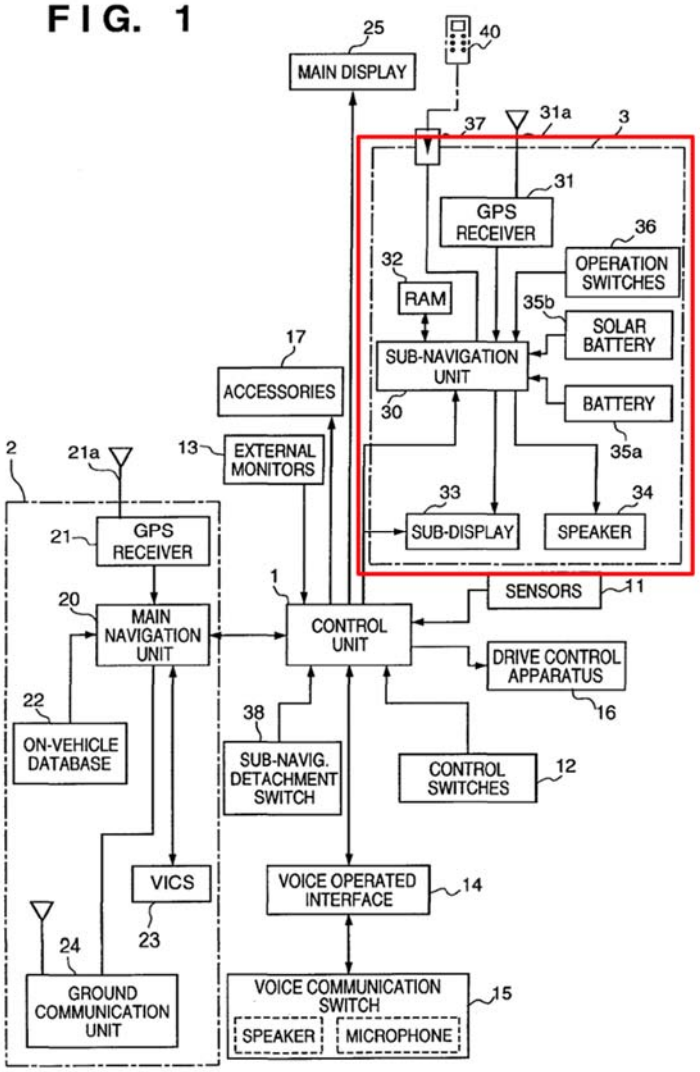
492. Ohmura discloses a sub-navigation apparatus 3 which is described as a portable terminal. For example:

> In FIG. 1, reference numeral 1 denotes a control unit for collectively controlling a vehicle; 2, a main navigation apparatus which is fixed to the vehicle (abbreviated as 'mainnavig.',

> hereinafter); and 3, ***a sub-navigation apparatus which is portable and detachable from the vehicle*** (abbreviated as 'sub-navig.', hereinafter).
>
> (*See* Ohmura, col. 7, lines 65 to col. 8, line 3, *emphasis added*)

493. Ohmura illustrates the sub-navigation unit in Figure 1, reproduced below with annotation.

FIG. 1



Ohmura FIG.1

494. Ohmura specifically describes that the user may use the sub-navigation apparatus while walking. For example:

> Accordingly, it is possible to obtain the map information of the current position of the user and its surrounding areas from the sub-navigation apparatus ***when the user is walking outside of the vehicle***.
>
> (*See* Ohmura, col. 3, lines 19-22, *emphasis added*)

495. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian applications, for example hiking. For example:

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that ***embodiments of the invention may be incorporated into almost any type of moving object, system, or simply carried by a person***. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, ***hikers or horseback riders*** may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not."
>
> (*See* Colley, col. 5, lines 31-42, *emphasis added*)

496. Colley describes that the device is specifically related to the display of navigational information to guide a user from their current position to ta desired destination. For example:

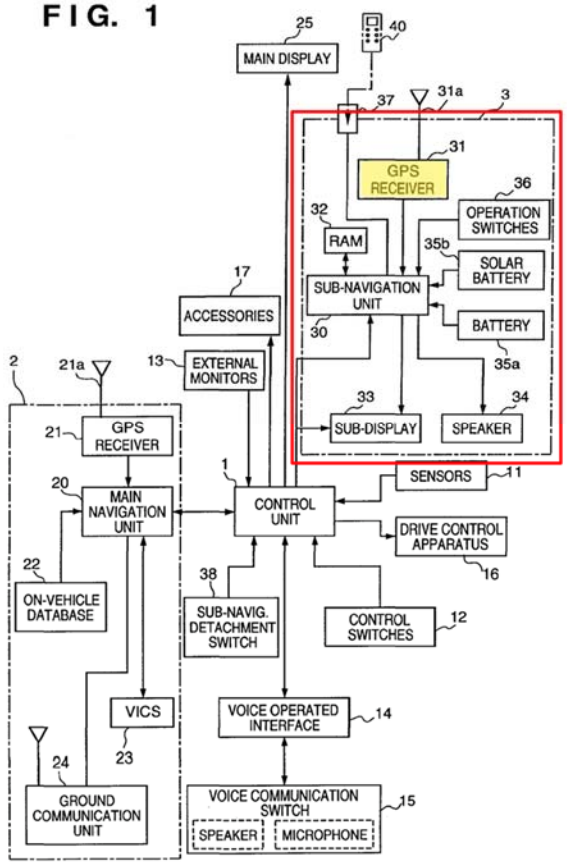
> The present invention relates to navigation and steering schemes for use in marine, land, and air directional control. More particularly, the present invention relates to the display and expression of position and navigation information in a ***simple***

> ***and direct format for immediate identification of the user's present location relative to a desired location***.
>
> (*See* Colley, col. 1, lines 7-13, *emphasis added*)

b. a device for getting a location information denoting a resent [sic] position of said portable terminal

497. Ohmura discloses a device for getting location information denoting a present place of said portable terminal. Specifically, Ohmura describes that the Sub-navigation unit includes a GPS receiver. For example:

> The sub-navig. 3 includes a sub-navigation unit 30 having an electronic control unit, for calculating the current position data and performing various controls of the sub-navig. 3, ***the GPS receiver 31***,…
>
> (*See* Ohmura, col. 9, lines 39-42, *partial excerpt*, , *emphasis added*)



Ohmura FIG. 1 *annotated*

498. Ohmura further describes that the sub-navigation unit "calculates position coordinate data, such as latitude and longitude of the current position" For example:

> The sub-navigation unit 30 outputs data based ***on GPS signals from the GPS satellites received by the GPS receiver 31*** to the main navigation unit 20 via the control unit 1 when the sub-navig. 3 is attached to the vehicle, and, when detaching the sub-navig. 3, the sub-navigation unit 30 controls so that predetermined map information outputted via the main navigation unit 20 and the control unit 1 is written to the RAM 32. Whereas, when the sub-navig. 3 is detached from the vehicle, the sub-navigation unit 30

> starts control operation in response to operations by the operation switches 36 as described above, ***calculates position coordinate data, such as latitude and longitude of the current position, on the basis of data based on the GPS signals received by the GPS receiver 31***, controls to display road map, for example, based on the road map data written in the RAM 32 on the sub-display 33, and displays a mark indicating the current position on the road map on the basis of the current position coordinate data, or controls to output the information by voice from the speaker 34.
>
> (*See* Ohmura, col. 10, lines 20-38, *emphasis added*)

499. Colley discloses that the navigation and guidance system determines the user's position and course.

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley at Abstract, *emphasis added*)

500. Colley further describes that the user's position can be determined using a GPS receiver. For example:

> For example, when electronic charts are integrated with a ***positioning system such as the global positioning system (GPS),*** the user's position can be displayed in real time on a chart depicting the user's area.
>
> (*See* Colley, col. 1, lines 18-22, *emphasis added*)

> Embodiments of the invention operate with navigation hardware (not shown) which is implemented to ***provide information concerning the user's current position***, the user's COG data, and the position/coordinates of the desired destination. ***For example, the navigation hardware may include a GPS receiver*** or LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer to drive the displays.
>
> (*See* Colley, col. 3, lines 31-38, *emphasis added*)

> Embodiments of the present invention ***utilize data retrieved from a variety of navigation systems, such as the global positioning system (GPS),*** LORAN, inertial navigation, and/or radar systems in conjunction with Point-of-Closest-Approach (PCA) calculations. The PCA is the point along the current course that is closest to a predefined destination.
>
> (*See* Colley, col. 2, line 65 to col. 3, line 4, *emphasis added*)

> ***The user's position and COG are determined by the navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley, col. 2, lines 20-2, *emphasis added* 3)

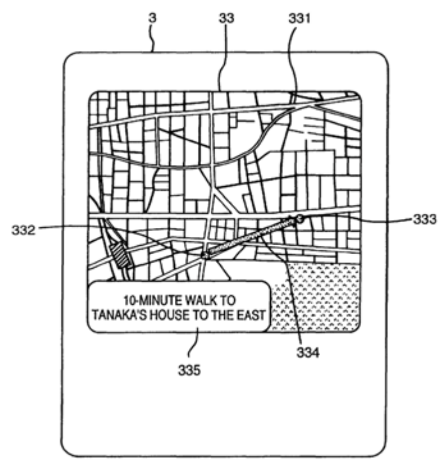
c. a device for getting direction information denoting an orientation of said portable terminal

501. Ohmura discloses a that the display displays the direction from the starting point to the destination. For example:

> Then the location of the house is displayed on the map image on the sub-display 33 on the basis of the address information. An

> example of displayed content on the sub-display 33 in such case is shown in FIG. 5. In the displayed image, a current position mark 332 indicating the current position of the user who is walking, a destination mark 333 showing the location of the house of the friend or the acquaintance where the user is to visit, and ***an arrow 334 showing the direction to the destination from the current position of the user are shown in the map image 331 displayed on the sub-display 33.***
>
> (*See* Ohmura, col. 12, lines 51-61, *emphasis added*)

FIG. 5



Ohmura FIG. 5

502. Colley discloses that the navigation and guidance system determine the user's course and the course required to reach the desired destination from the current position. For example:

> A navigation and guidance system which ***directs a user toward a desired destination***. Position and steering information are integrated into a single display to allow the user to immediately ***determine whether the correct course is being traveled,*** and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation***

> ***system*** and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley at Abstract, *emphasis added*)

503. Colley refers to the user's COG (Course over Ground), and the user's "track", which a PHOSITA would understand to be the current heading or direction of travel. For example:

> "The actual track of the user is displayed relative to the segment waypoints such that the user's actual track is superimposed over the optimum route. The ***user's position and COG are determined by the navigation system*** and indicated on the display as a ***directional pointing icon***, such as a line or arrow."
>
> (*See* Colley, col. 2, lines 18-24, *emphasis added*)
>
> ***Current commercially available electronic chart display*** implementations typically ***indicate*** relevant geographic features, routes and waypoints, the user's position, ***and the user's track***.=
>
> (*See* Colley, col. 1, lines 31-34, *emphasis added*)

504. Colley illustrates this, for example in Figure 1, reproduced below. In this figure, the dotted line 112 corresponds to the user's current track, and the angle of the arrow at the end of this line is the user's direction of travel. For example:

> For example, FIG. 1(a) shows the current implementation in most commercial systems. A desired route with dotted waypoints 102 is indicated by the straight lines 104 which comprise the intended track 114. The destination waypoint is shown as a circled dot 110, and ***the dotted line 112 indicates the user's actual track***. In the example, ***the arrow 116 at the top end of the dotted line 112 shows the user's position and current heading***.
>
> (*See* Colley, col. 1, lines 45-53, *emphasis added*)

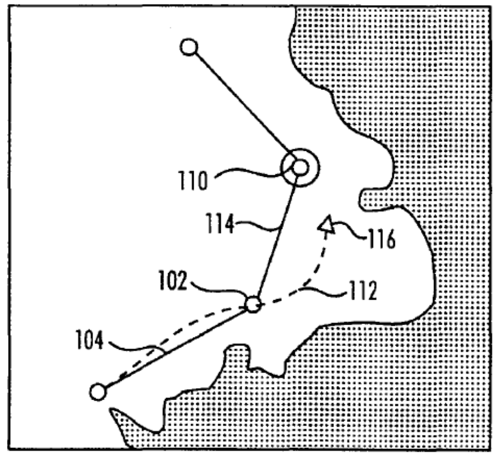


FIG. 1a

Colley FIG. 1a.

505. To the extent that it is determined that Ohmura does not explicitly describe a "device for getting direction information denoting an orientation of said portable terminal", it would be obvious to a PHOSITA to include functionality to either provide device orientation (i.e. and indication of which direction is North) or to rotate the display so that the directional arrow would point to the destination. For example, as shown in Figure 5 of Ohmura, the display states "10 minute walk to Taanaka's house to the east", but unless the user knows which direction east lies, they would still not know how to proceed to Tanaka's house. This problem would be obvious to a PHOSTA, and thus they would understand that Ohmura would implicitly include such functionality.

506. It would also be obvious to a PHOSITA to include the compass and device orientation functionality of Colley in the sub-navigation unit of Ohmura.

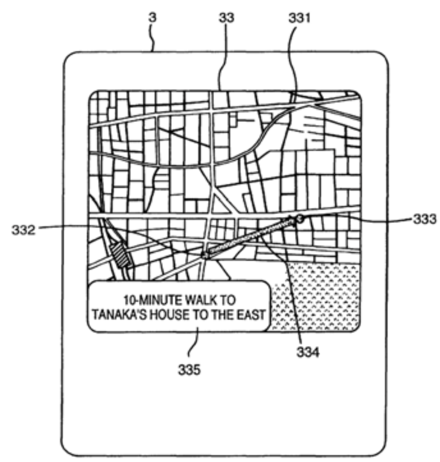
507. This improvement to Ohmura would assure, for example, that the directional arrow of Ohmura would point toward the destination, so that if, for example the user was not facing due north the designation that Tanaka's house is to the East would be meaningful.

508. In this combination, each device would be serving the same function as it did in its original application. That is, Ohmura's sub-navigation device would still be determining route information based on its location provided by its GPS receiver, the compass of the Colley system would be providing the orientation of the device relative to the earth's coordinate system, and the software of Colley would be causing the map display to maintain, for example, a north orientation as the orientation of the device changed. This display would assure, as described in Colley, that the direction to the destination was always displayed in a way that the user could be certain which way to go to reach the destination. This would thus represent a combination of known elements to achieve a predictable result.

509. As shown in Figure 5 of Ohmura, the display states "10 minute walk to Tanaka's house to the east", using the orientation functionality of Colley with the navigation system of Ohmura, the map display would always be oriented with north on the map facing true north on the earth, and thus the arrow pointing in the

actual direction of Tanaka's house, and the statement that his house was "to the east" would be more useful to the user.

FIG. 5



Ohmura FIG. 5

d. an input device for inputting a destination

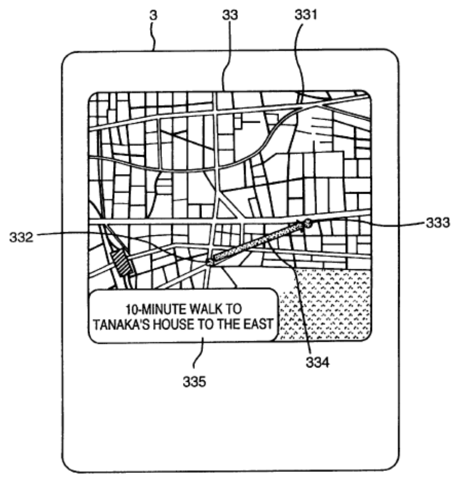
510. Ohmura discloses that the user may input the phone number of the destination, and the system will determine from the phone number, the destination. Thus, Ohmura discloses this limitation. For example:

> For example, assume that the location of a house of a friend or an acquaintance is not known and a user wants to display the location of the house on the map image displayed on the sub-display 33. In such case, a cellular phone 40, for example, is connected to the telephone terminal 37, further to the main-navig. 2 on the vehicle via the telephone communication means in the same manner as described above. Thereafter, the ***user inputs telephone number of the friend or acquaintance, in turn, address information corresponding to the telephone number is transmitted from the on-vehicle database 22 and written to the RAM 32 of the sub-navig. 3.*** Then the location of the house is

> displayed on the map image on the sub-display 33 on the basis of the address information.
>
> (*See* Ohmura, col. 12, lines 39-53, *emphasis added*)
>
> An example of displayed content on the sub-display 33 in such case is shown in FIG. 5. In the displayed image, a current position mark 332 indicating the current position of the user who is walking, ***a destination mark 333 showing the location of the house of the friend*** or the acquaintance where the user is to visit, and an arrow 334 showing the direction to the destination from the current position of the user are shown in the map image 331 displayed on the sub-display 33.=
>
> (*See* Ohmura, col. 12, lines 53-61, , *emphasis added, see also* Fig. 5)

511. A PHOSITA would have also found it obvious to use phone numbers as identifiers of destinations, as opposed to the destinations themselves. For example, a PHOSITA would understand that an address is an unambiguous name for a place so that a user seeking to go to a place can use the address as a type of name for that place. Similarly, many landmarks are identified by a name that has no direct relation to the specific location of the landmark (e.g., the geographic coordinates of the landmark). Thus, a PHOSITA would understand that using a phone number as a name for a destination would be no different than using any other type of name to represent the destination.

FIG. 5



Ohmura FIG. 5

512. Colley describes that the destination is determined (or input) using the Navigation hardware that "may include a GPS receiver or LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer". A PHOSITA would understand that the navigation hardware described by Colley would include a means for inputting the destination, for example by indicating it on an "electronic chart", since the navigation system would not, by itself, have this information. For example:

> Embodiments of the invention operate with ***navigation hardware*** (not shown) which is implemented to provide information concerning the user's current position, the user's COG data, and ***the position/coordinates of the desired destination***. ***For example, the navigation hardware may include a GPS receiver or LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer to drive the displays***.

> (*See* Colley, col. 3, lines 31-38, *emphasis added)*
>
> A positioning apparatus for indicating integrated directional and point of closest approach (PCA) information to a user traveling along a current course toward a desired destination, the positioning apparatus operable with a computer and a navigation system providing the user's current position data, destination position data, bearing data, and course-over-ground (COG) data, comprising: ***destination position means for indicating the position of the desired destination****; …*
>
> (*See* Colley at Claim 2, *partial excerpt, emphasis added)*
>
> An integrated steering indicator operable with a programmable computer and a navigation system, the integrated steering indicator for displaying point of closest approach (PCA), route, and position information to a traveling operator, to direct the operator from an origin to a desired destination, the origin and desired destination having an associated origin waypoint and a destination waypoint, respectively, ***the positions of the origin and destination waypoints being determined by the navigation system***, respectively, the integrated steering indicator comprising: an origin waypoint indicator for displaying the position of the origin waypoint; ***a destination waypoint indicator for displaying the position of the destination waypoint relative to the origin waypoint****;…*
>
> (*See* Colley at Claim 12, *partial excerpt emphasis added)*

513. To the extent that it is determined that the phone number input of Ohmura does not meet the limitation of an input device for inputting a destination, A PHOSITA would have found it obvious to use the navigation system of Colley to allow the user to enter destination information. In such a combination, each device would be performing the same functions as it was in its original application, and

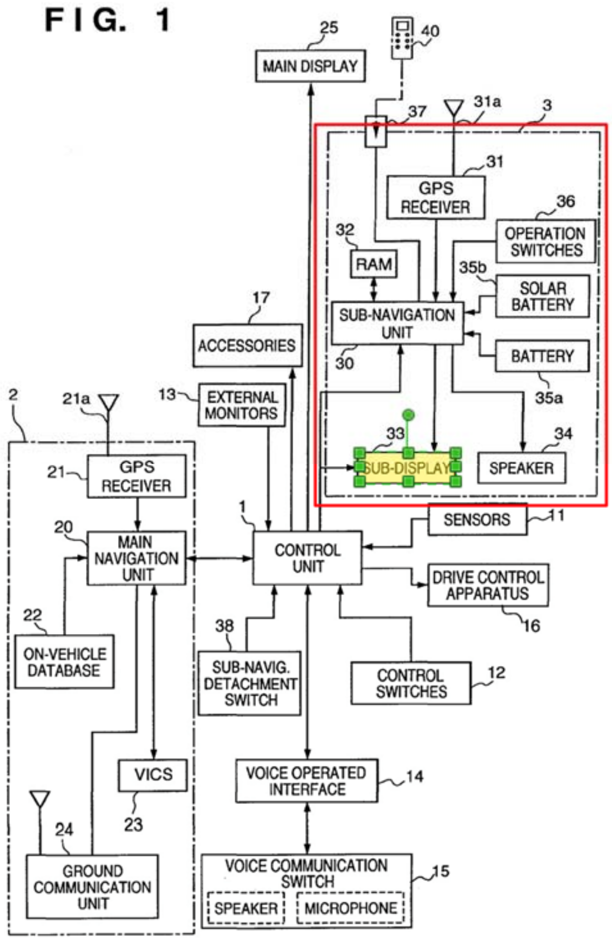
the combination would yield the predictable result of determining a route to a particular destination as described by Ohmura, based on an input by the user, using Colley's navigation system. This combined system would have the advantage of avoiding the need for the user to recall the phone number associated with the destinations and thus would provide an additional level of flexibility to the system.

e. a display

514. Ohmura discloses that the sub-navigation system includes a sub-display 33. For example:

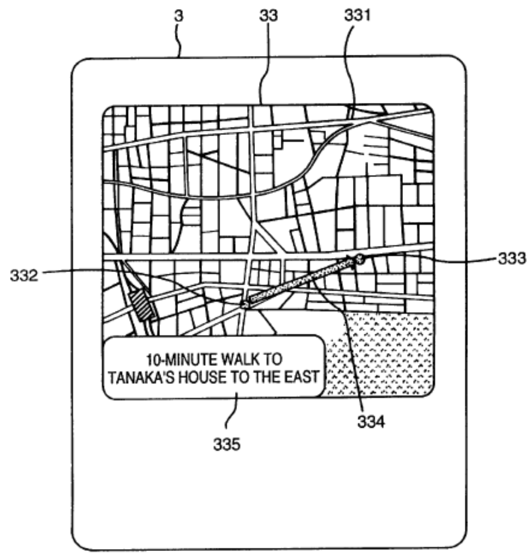
> The sub-navig. 3 includes a sub-navigation unit 30 having an electronic control unit, for calculating the current position data and performing various controls of the sub-navig. 3, the GPS receiver 31, a RAM 32 as a sub-storage means which information, explained later, can be written and read to/from***, a sub-display 33 having a display screen*** …
>
> (*See* Ohmura, col. 9, lines 39-44, *emphasis added*)

515. Ohmura illustrates this display in Figure 1, reproduced with annotation below, and in Figure 5, reproduced below.



Ohmura FIG. 1 *annotated*

FIG. 5



Ohmura FIG. 5

516. Colley also discloses a display.

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are ***integrated into a single display*** to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. The user's position and course are determined by a navigation system and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley at Abstract, *emphasis added*)

> "The desired destination is ***displayed*** on an electronic charting system by a destination waypoint."
>
> (*See* Colley, col. 2, lines 12-14, *emphasis added)*

517. Colley Describes the details of the display in connection with Figure 2, reproduced below.

> The actual track of the user is ***displayed*** relative to the segment waypoints such that the user's actual track is superimposed over the optimum route. The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley, col. 2, lines 18-23, , *emphasis added, see also* FIG. 2)

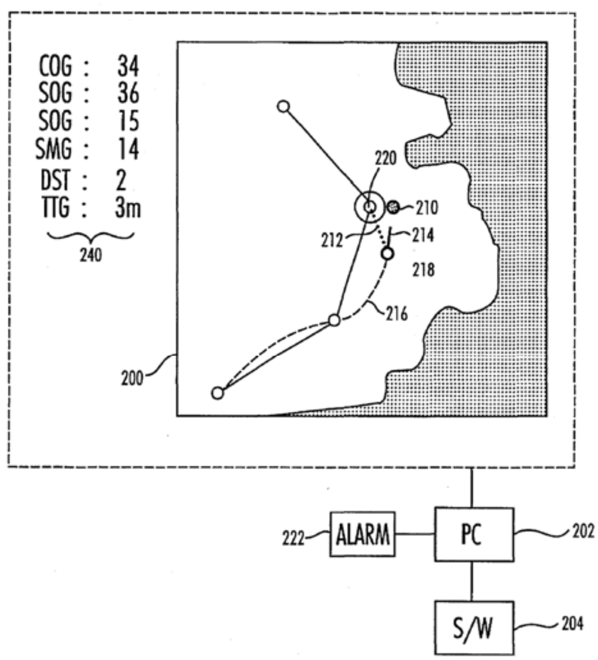


FIG. 2

Colley Figure 2

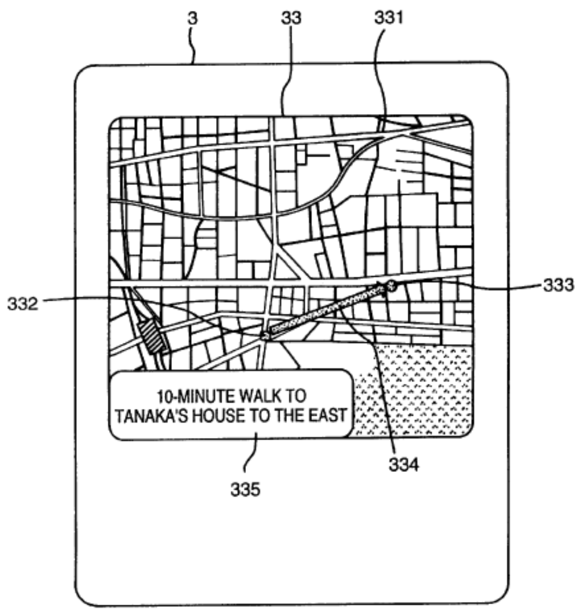
f. wherein said display displays positions of said destination and said present place, and a relation of

said direction and a direction from said present place to said destination"

518. Ohmura discloses a display that displays positions of said destination and said present place. Specifically, Ohmura illustrates, for example, in Figure 5, reproduced below, the starting point for navigation (the "present place") and the destination. For example:

> Then ***the location of the house is displayed on the map image on the sub-display 33*** on the basis of the address information. An example of displayed content on the sub-display 33 in such case is shown in FIG. 5. In the displayed image, ***a current position mark 332 indicating the current position of the user who is walking, a destination mark 333 showing the location of the house of the friend or the acquaintance where the user is to visit, and an arrow 334 showing the direction to the destination from the current position of the user are shown in the map image 331 displayed on the sub-display 33.***
>
> (*See* Ohmura, col. 12, lines 51-61, *emphasis added*)

FIG. 5



Ohmura FIG. 5

519. Ohmura also discloses a relation of said direction and a direction from said present place to said destination. As can be appreciated in Figure 5, above, the display indicates that Tanaka's house it to the east, and shows an arrow pointing to the right of the screen. A PHOSITA would understand that in order to indicate the direction of east on the screen in relation to the top of the screen being north, as indicated in the figure, the system would necessarily determine the direction of the destination from the starting point to the destination, relative to the display of the device. A PHOSITA would understand that the orientation of the map in the figure is such that the arrow indicating the direction to Tanaka's house forms an angle relative to the forward (or vertical) axis of the display screen. The PHOSITA

would understand that this angle is the direction *relative* to north on the screen, and thus it represents a "a relation of said direction and a direction from said present place to said destination."

520. Colley discloses a display that "displays positions of said destination and said present place to said destination", and further discloses a display that "displays "a relation of said direction and a direction from said present place to said destination". For example:

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. **The *user's position and course are determined by a navigation system and indicated on the display as a directional pointing icon, such as a line or arrow***.
>
> (*See* Colley at Abstract, *emphasis added*)

> Thus, preferably the display 200 shows a graphical representation of numerical data combined with instantaneous course correction information. The actual track 216 of the user is designated as a dotted line. The PCA 210 is shown relative to ***the user's current position 218 and the destination waypoint 220***. *A* ***bearing-to-destination (BTD) indicator 212*** connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint.
>
> (*See* Colley, col. 3, lines 39-47, *emphasis added*)

> More particularly, in FIG. 3, the BTD indicator 212, ***the COG indicator 214***, and the PCA 210 are illustrated in enlarged detail. As explained above, by combining the steering and navigation indicators into a single, integrated display system 200 (FIG. 2), users can quickly and easily determine their current locations relative to the desired destinations 220, and how to best reach the desired destinations.
>
> (*See* Colley, col. 4, lines 8-15, *emphasis added*)

> The ***user's position and COG are determined by the navigation system and indicated on the display*** as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley, col. 2, lines 20-23, *emphasis added*)

521. This is further illustrated in Figures 2 and 3 reproduced below, wherein the destination is labeled item 220, the current position is labeled 218, and the relative direction from the current heading to the destination is shown by the difference in angle between the course over ground (COG) indicator 214, and the bearing-to-destination line 212.

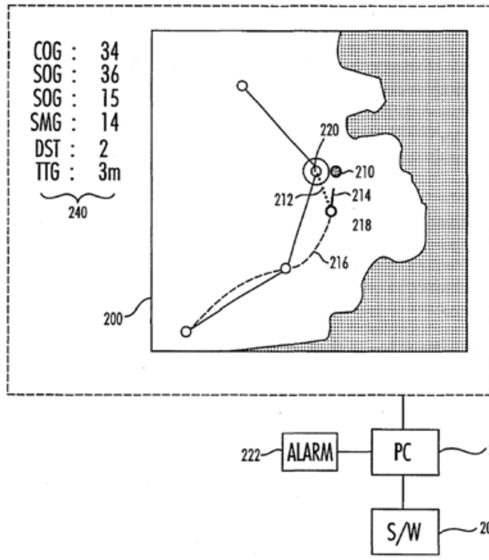


FIG. 2

Colley FIG. 2

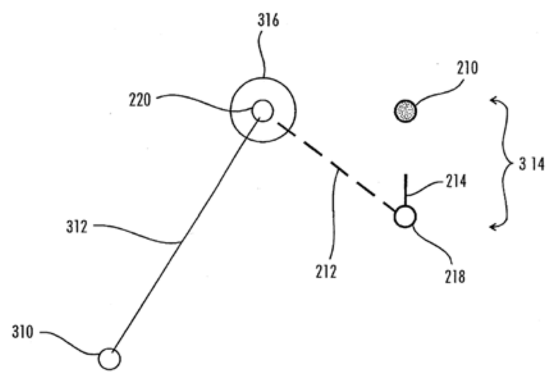


FIG. 3

Colley FIG. 3.

522. To the extent that it is determined that the display of Ohmura does not determine “a relation of said direction and a direction from said present place to said destination”, it would be obvious to a PHOSITA to include the display orientation functionality described by Colley in the sub-navigation unit of Ohmura. In this combination, the display of Ohmura would rotate so that, as described by Colley, the arrow indicating the direction to the destination would always point at

the destination. In such a combination, each device would be performing the same functions as it was in its original application (Ohmura providing destination input, route finding and map display functionality, and Colley providing device orientation information), and the combination would yield the predictable result of indicating the direction to a destination as described by Ohmura, using Colley's improved display system that assured that the directional arrow was always pointed toward the destination, even as the orientation of the sub-navigation unit changed. This combined system would have the advantage, described by Colley of providing an improved display that was more intuitive and more effective at guiding the user to the destination.

g. said display changes according to a change of said direction of said portable terminal orientation for walking navigation

523. Colley discloses that "said display changes according to a change of said direction of said portable terminal orientation for walking navigation". For example:

> Accordingly, in preferred embodiments, as the computer and software arrangement continuously determines the COG and BRG values, and ***the corresponding graphical representations are displayed on the steering screen***, the user can manually or automatically direct the PCA indicator 210 toward the destination waypoint 220.
>
> (*See* Colley, col. 4, lines 53-58, *emphasis added*)

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. ***A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), distance to waypoint (DST), and the time to go (TTG).*** The numerical table or listing 240 is optional in that ***the numerical data is embodied by the movement of the graphical icons illustrated in the display 200.*** Accordingly, reference to a numerical coordinates table is unnecessary for steering and position correction or adjustment.
>
> (*See* Colley, col. 3, lines 19-30, *emphasis added*)

524. Ohmura specifically describes that the user may use the sub-navigation apparatus while walking. For example:

> Accordingly, it is possible to obtain the map information of the current position of the user and its surrounding areas from the sub-navigation apparatus ***when the user is walking outside of the vehicle***.
>
> (*See* Ohmura, col. 3, lines 19-22, *emphasis added*)

525. I note that the use of the sub-navig. device described by Ohmura as applied to the asserted claims is used while the device is outside the vehicle, that is, for a user who is walking. This it comports with either the plaintiff's or the defendant's constructions of the term "walking navigation"

526. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian (i.e. "walking") applications, for example hiking.

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that ***embodiments of the invention may be***

> ***incorporated into almost any type of moving object, system, or simply carried by a person***. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, ***hikers*** or horseback ***riders*** may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not.
>
> (*See* Colley, col. 5, lines 31-42, *emphasis added*)

527. I note that while Colley describes that the device could be "incorporated into almost any type of moving object", he specifically describes it as being "simply carried by a person. Because Colley does not require that a single instance of the device be capable of serving in both applications it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

ii. Claim 2

a. A portable terminal according to claim 1, wherein said direction from said present place to said inputted destination is denoted with an orientation of line"

528. Claim 2 depends from Claim 1 and adds the further limitation "wherein said direction from said present place to said inputted destination is denoted with an orientation of line".

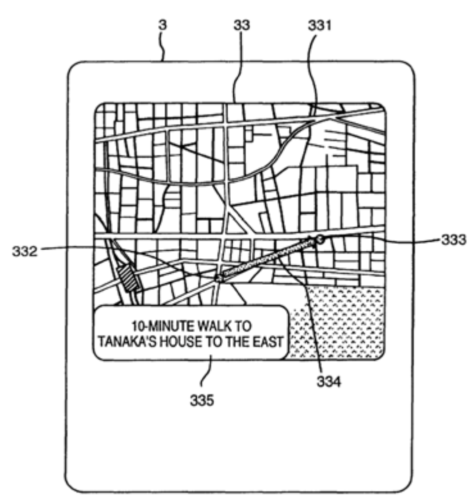
529. As described above, Ohmura in combination with Colley renders Claim 1 obvious.

530. Ohmura discloses a portable terminal according to claim 1, wherein said direction from said present place to said inputted destination is denoted with an

orientation of line. Specifically, Ohmura indicates the direction to the destination, for example in Figure 5, reproduced below, using a line. For example:

> Then ***the location of the house is displayed on the map image on the sub-display 33*** on the basis of the address information. An example of displayed content on the sub-display 33 in such case is shown in FIG. 5. In the displayed image, ***a current position mark 332 indicating the current position of the user who is walking, a destination mark 333 showing the location of the house of the friend or the acquaintance where the user is to visit, and an arrow 334 showing the direction to the destination from the current position of the user are shown in the map image 331 displayed on the sub-display 33.***
>
> (*See* Ohmura, col. 12, lines 51-61, *emphasis added, see also* FIG. 5)

FIG. 5



Ohmura FIG. 5

531. Colley describes that the display includes a "bearing-to-destination indicator" that is represented on the display as a dotted line from the current position to the destination. For example:

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), distance to waypoint (DST), and the time to go (TTG).
>
> (*See* Colley, col. 3, lines 19-25)

> A bearing-to-destination (BTD) indicator 212 connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint.
>
> (*See* Colley, col. 3, lines 44-47)

532. This is illustrated as item 212 in Figures 2 and 3, reproduced below.

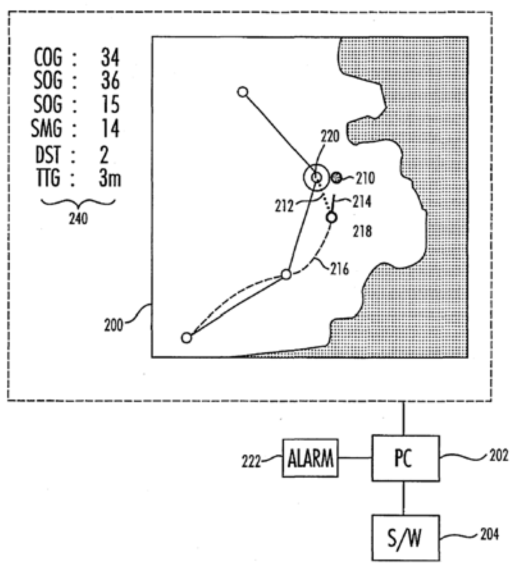


FIG. 2

Colley FIG. 2

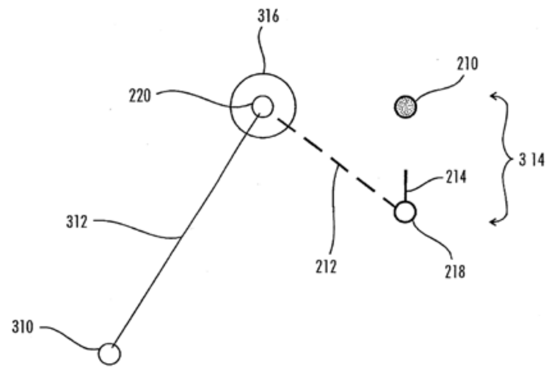


FIG. 3
Colley FIG. 3.

> The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, ***such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

iii. Claim 3

a. A portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number

533. Claim 3 depends from Claim 1, and adds the further limitation "wherein a distance between said present place and said destination is denoted with a number".

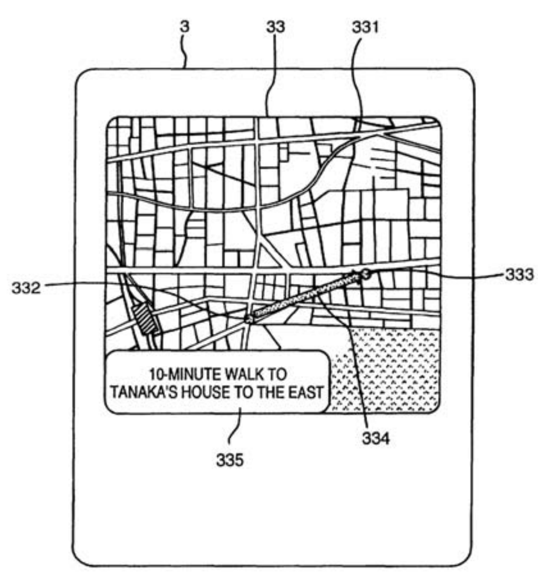
534. As described above, Ohmura in combination with Colley renders Claim 1 obvious.

535. Ohmura discloses a portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number.

Specifically, Ohmura computes the distance and time to the destination, and displays this information together with the map image. For example:

> Then the location of the house is displayed on the map image on the sub-display 33 on the basis of the address information. An example of displayed content on the sub-display 33 in such case is shown in FIG. 5. In the displayed image, a current position mark 332 indicating the current position of the user who is walking, a destination mark 333 showing the location of the house of the friend or the acquaintance where the user is to visit, and an arrow 334 showing the direction to the destination from the current position of the user are shown in the map image 331 displayed on the sub-display 33. *In addition,* ***the distance from the current position of the user to the destination is calculated, a approximately required time to arrive at the destination is calculated on the basis of the calculated distance and a normal walking speed, and character information 335 indicating the above information are displayed together with the map image.***
>
> (*See* Ohmura, col. 12, lines 51-61, *emphasis added*)

FIG. 5



Ohmura FIG. 5

536. Colley also describes providing the distance from the current position to the destination as a number. For example:

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), ***distance to waypoint (DST)***, and the time to go (TTG). The ***numerical table or listing 240*** is optional in that the numerical data is embodied by the movement of the graphical icons illustrated in the display 200.
>
> (*See* Colley, col. 3, lines 19-28, *emphasis added*)

537. This numerical display of distance is also shown in Figure 2, reproduced below. Here the designator “DST” is used to identify the distance to the destination.

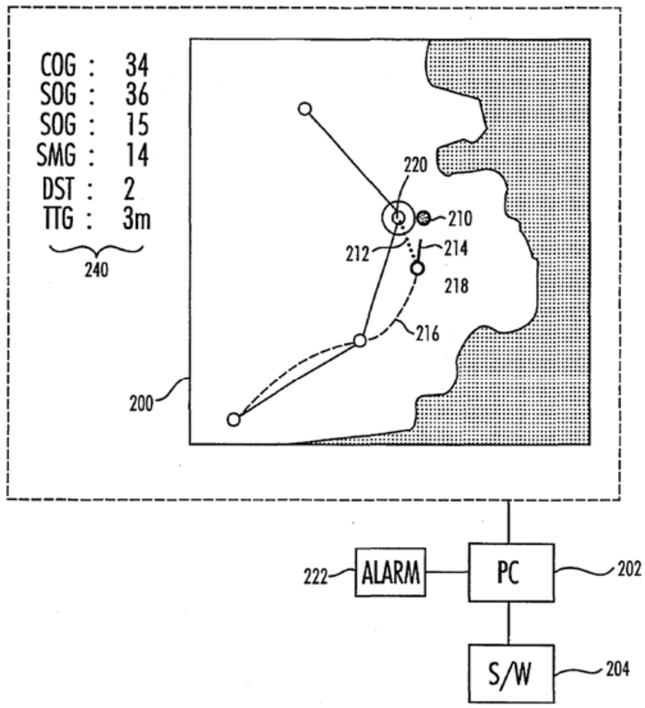


FIG. 2

Colley FIG. 2

iv. **Claim 15**

a. **A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination**

538. Claim 15 depends from Claim 1, and adds the further limitation "a device for retrieving a route from said present place to said destination".

539. As described above, Ohmura in combination with Colley renders Claim 1 obvious.

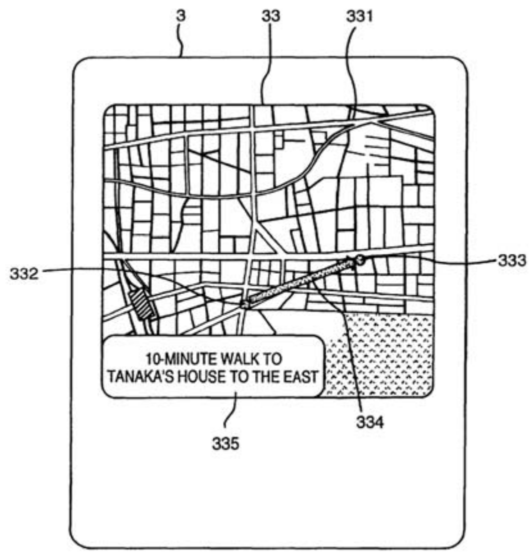
540. Ohmura explicitly describes a device that retrieves a route from the user's current location at the time they request a route to the destination associated with the phone number they input. For example:

> Thereafter, the user inputs telephone number of the friend or acquaintance, in turn, address information corresponding to the telephone number is transmitted from the on-vehicle database 22 and written to the RAM 32 of the sub-navig. 3. ***Then the location of the house is displayed on the map image on the sub-display 33 on the basis of the address information.***
>
> (*See* Ohmura, col. 12, lines 47-53, *emphasis added*)

> An example of displayed content on the sub-display 33 in such case is shown in FIG. 5. ***In the displayed image, a current position mark 332 indicating the current position of the user who is walking, a destination mark 333 showing the location of the house of the friend or the acquaintance where the user is to visit, and an arrow 334 showing the direction to the destination from the current position of the user are shown in the map image 331*** displayed on the sub-display 33.
>
> (*See* Ohmura, col. 12, lines 53-61, *emphasis added*)

541. Ohmura illustrates this route in FIG. 5, reproduced below.

FIG. 5



Ohmura FIG. 5

542. Colley describes a device for retrieving a route from a current position (present place) to a destination. In the Colley system, the Navigation System provides (or retrieves) a set of "waypoints". A PHOSITA would understand that these waypoints represent the starting point, intermediate destinations between the starting point and the final destination, and that the path connecting these waypoints is commonly known as the "route". The final destination is simply the last waypoint in the set. For example:

> ***Current commercially available electronic chart display implementations typically indicate relevant geographic features, routes and waypoints***, the user's position, and the user's track.
>
> (*See* Colley, col. 1, lines 32-34, *emphasis added*)

543. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian (i.e. "walking") applications, for example hiking.

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that **embodiments of the invention may be incorporated *into almost any type of moving object, system, or simply carried by a person***. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, ***hikers*** or horseback ***riders*** may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not."
>
> (*See* Colley, col. 5, lines 31-42, *emphasis added*)

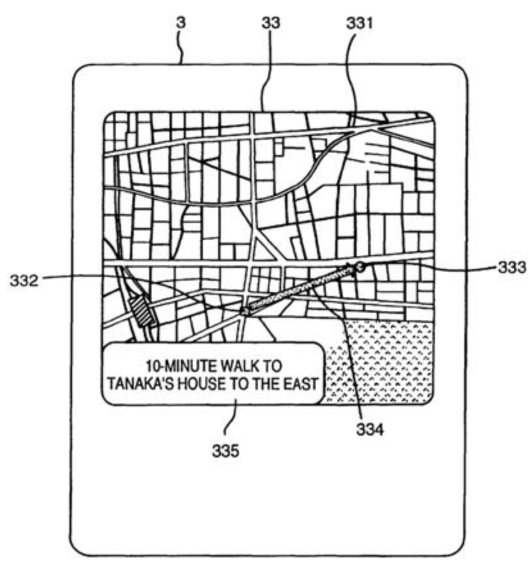
544. To the extent that the arrow of Ohmura is found to not meet the limitation of a "route", a PHOSITA would find it obvious to include the more detailed route described by Colley in the map display of Ohmura's sub-navigation unit. This more detailed route would provide the user with more specific direction as to which roads or paths to take, and where to turn, and thus would provide a more effective navigation aid. In this combination, each device would be serving the same function as it does in its original application. That is, Ohmura's sub-navigation device would still be determining route information based on its location provided by its GPS receiver, and the location of the destination provided by the main navigation unit, and the Colley system would compute routes from one

waypoint to another, multiple times, instead of using only a single destination waypoint. This combination would produce the predictable result of showing a more detailed multi segment route to the destination. The addition of this functionality to the Ohmura system would improve the navigational effectiveness of the Ohmura system.

b. wherein said display displays said route and displays a direction of movement by the arrow

545. Ohmura discloses a display that displays said route and displays a direction of movement using an arrow. Ohmura illustrates this arrow in FIG. 5, reproduced below.

FIG. 5



Ohmura FIG. 5

546. Colley also describes that the "display displays said route" (lines 104 and 114 in Figure 1 above), and displays the direction of movement using an arrow (illustrated as item 116 in Figure 1, above). For example:

> For example, FIG. l(a) shows the current implementation in most commercial systems. ***A desired route with dotted waypoints 102 is indicated by the straight lines 104 which comprise the intended track 114***. The destination waypoint is shown as a circled dot 110, and the dotted line 112 indicates the user's actual track.
>
> (*See* Colley, col. 1, lines 45-50, *emphasis added, see also* FIG 1a)

> The user's position and COG are determined by the navigation system and indicated on the display as a ***directional pointing icon, such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

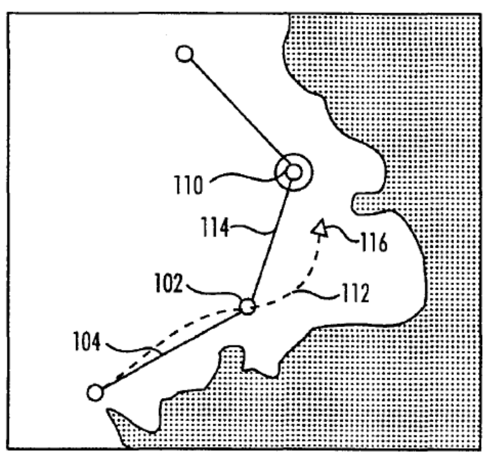


FIG. 1a

547. Colley also describes this limitation in connection with Figure 3 where the legs of the route are described as lines connecting waypoints. For example

> An origin waypoint 310 represents one of the segment waypoints, as shown in FIG. 2. ***The origin waypoint is often described with respect to point-to-point navigation, which allows the user to follow multiple straight-line segments along a route.*** The origin waypoint indicates the beginning of the leg, while the destination waypoint indicates the end of the leg. ***By connecting the points along the route, each origin and destination waypoint describes a leg of the route, which is shown in FIG. 3 as a desired track 312***.
>
> (*See* Colley, col. 4, lines 16-24, *emphasis added*)

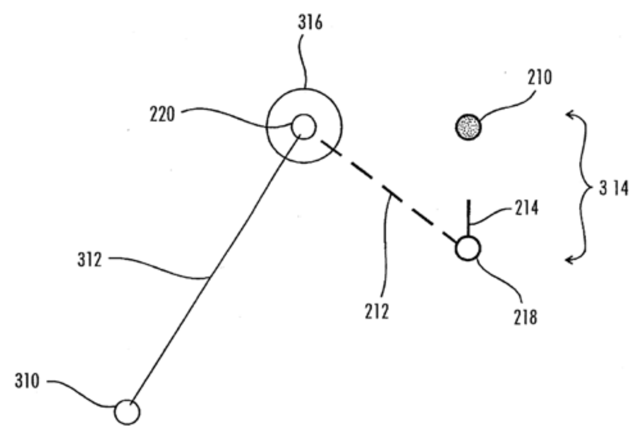


FIG. 3

Colley FIG. 3

v. Claim 16

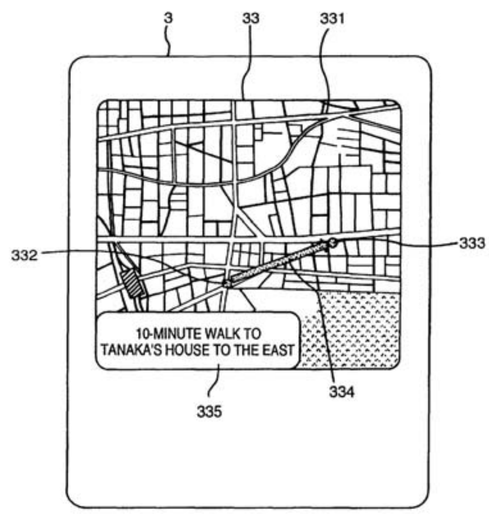
a. A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route."

548. Claim 16 depends from Claim 15, which depends from Claim 1 and adds the further limitation "wherein said display further displays said grid information of said route".

549. As described above, Ohmura in combination with Colley renders Claim 1 obvious.

550. As described elsewhere in this report, in my opinion, Claim 16 is invalid for indefiniteness and/or lack of written description. However, to the extent that it is determined that "said grid information" is road grid information, Ohmura displays a street grid together with the route. For example, see Figure 5 reproduced below.

FIG. 5



Ohmura FIG. 5

vi. Claim 17

a. A portable terminal with walking navigation according to claim 15, wherein said display displays said route with a bent line using symbols denoting

starting and ending points and displays symbols denoting said present place on said route.

551. Claim 17 depends from Claim 15, which depends from Claim 1, and adds the further limitation "wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route".

552. As described above, Ohmura in combination with Colley renders Claim 1 and Claim 15 obvious.

553. As described above in connection with Claim 15, Ohmura displays a line with an arrow indicating the direction for the user to walk to get to their destination.

554. Colley describes that the route is represented on the display as a sequence of linked line segments connecting the various waypoints. As can be appreciated in the Figures 1 and 2 below, the resulting line follows the waypoints, and this defines the route. As the waypoints are not necessarily collinear, the line will be "bent". For example:

> The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, ***such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

> Thus, preferably the display 200 shows a graphical representation of numerical data combined with instantaneous

course correction information. The ***actual track 216*** of the user is designated as a dotted line. The PCA 210 is shown relative to ***the user's current position 218 and the destination waypoint 220***. *A* ***bearing-to-destination (BTD) indicator 212*** connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint.

(*See* Colley, col. 3, lines 39-47, *emphasis added*)

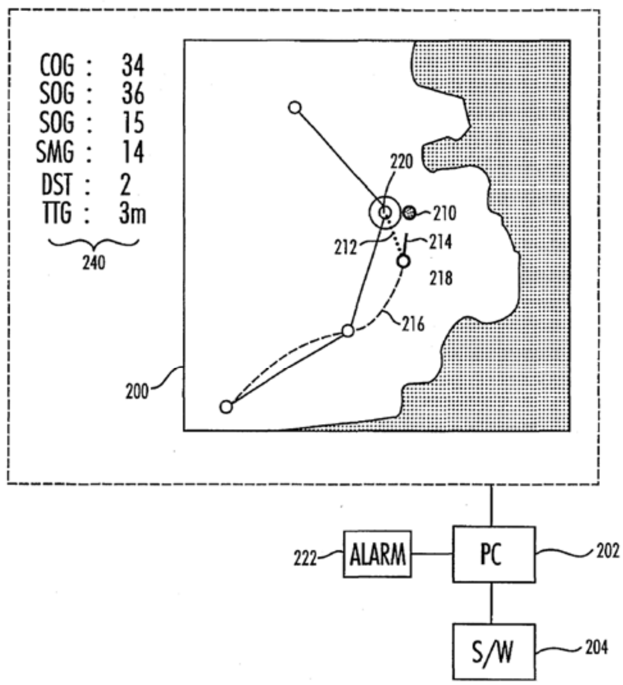


FIG. 2

Colley FIG. 2

An origin waypoint 310 represents one of the segment waypoints, as shown in FIG. 2. The origin waypoint is often described with respect to point-to-point navigation, which allows the user ***to follow multiple straight-line segments along a route.*** The origin waypoint indicates the beginning of the leg, while the destination waypoint indicates the end of the leg. By connecting the points along the route, each origin and destination waypoint describes a leg of the route, which is shown in FIG. 3 as a desired track 312.

(*See* Colley, col. 4, lines 16-24, *emphasis added*)

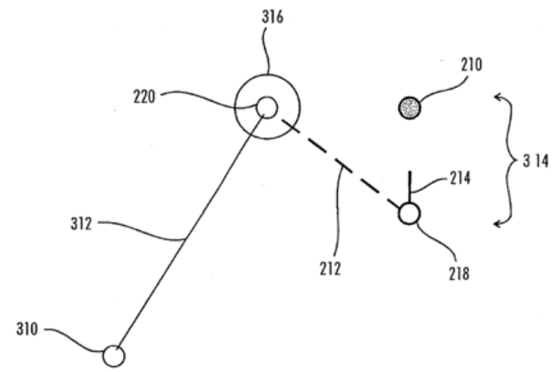


FIG. 3

Colley FIG. 3

555. As described in connection with claim 15, and for the same reasons, a PHOSITA would find it obvious to use the waypoint based route display of Colley in the system of Ohmura.

vii. Claim 20

a. A portable terminal with walking navigation according to claim 17, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route.

556. Claim 20 depends from Claim 17, which depends from Claim 15, which depends from Claim 1, and adds the further limitation "wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route".

557. For the same reasons presented above in relation to Claim 17, this claim is also invalid.

i. The Combination of Ohmura and Colley

558. A PHOSITA would find it obvious to combine Ohmura and Colley in the ways described above. First, both Ohmura and Colley relate to portable navigation devices, and, in a similar manner to Ohmura's determination of the destination using a separate "main navigation unit", Colley depends on a separate "navigation unit" to generate the waypoints that make up the route. For example:

> In such case, a cellular phone 40, for example, is connected to the telephone terminal 37, further to the main-navig. 2 on the vehicle via the telephone communication means in the same manner as described above. ***Thereafter, the user inputs telephone number of the friend or acquaintance, in turn, address information corresponding to the telephone number is transmitted from the on-vehicle database 22 and written to the RAM 32 of the sub-navig. 3.***
>
> (*See* Ohmura, col. 12, lines 43-51, *emphasis added*)

> ***An integrated steering indicator operable with a programmable computer and a navigation system***, the integrated steering indicator for displaying point of closest approach (PCA), route, and position information to a traveling operator, to direct the operator from an origin to a desired destination, the origin and desired destination having an associated origin waypoint and a destination waypoint, respectively, ***the positions of the origin and destination waypoints being determined by the navigation system, respectively***…
>
> (*See* Colley, col. 7, lines 5-14, *emphasis added*)

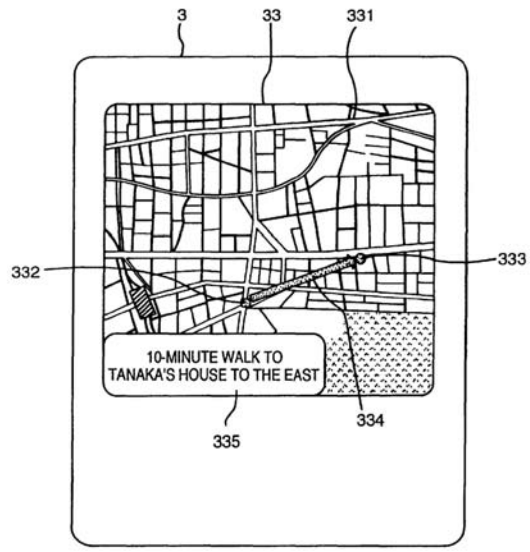
559. Thus, a PHOSITA would be likely to consider the Colley reference when seeking to improve Ohmura.

560. In addition, Ohmura anticipates that "***more detailed*** information", for example the waypoints described by Colley, may be useful to the user, and provides a mechanism to retrieve this more detailed information from the main navigation unit. For example:

> … ***when new map information is necessary***, or if the user is in the area within the stored map information, but ***when the user needs more detailed information, information can be obtained from the main storage means on the vehicle*** via the telephone communication means, which increases availability and convenience.
>
> (*See* Ohmura, col. 3, lines 56-61, *partial excerpt*, *emphasis added*)

561. In addition, Colley provides an indication of which direction to travel to get to the destination. A skilled artisan implementing the system of Ohmura would understand that unless the display of the directional arrow shown in Figure 5, reproduced below, changed with the orientation of the device, or unless the user was informed as to which direction was north, the display of Ohmura would not be useful in guiding the user to the destination.

FIG. 5



562.

563. Ohmura FIG. 5

564. Because the PHOSITA would be aware of Colley, they would thus also be aware that Colley addresses exactly the problem of telling the user which direction to travel to reach the destination, and they would be motivated to apply this teaching of Colley to the system of Ohmura in order to assure that the display was useful.

J. Claims 1-3, 6-8, 15-17, and 20 of the '317 Patent are Anticipated by Almbaugh

565. In my opinion Almbaugh anticipates Claims 1-3, 15-17, and 20 of the '317 patent. In the sections below I have laid out the basis for my opinion for the various claim elements.

i. Claim 1

566. Claim 1 is an independent claim.

a. A portable terminal, comprising:

567. Almbaugh discloses a travel guide that is described as being portable, that is usable while riding in various vehicles, or, for example, while walking. For example:

> Although depicted as being utilized in conjunction with a vehicle, the travel guide device has application in a variety of modes of travel, including land-based vehicles (passenger vehicles, off-road vehicles, etc.), aircraft, boats, transportation by animal and walking.
>
> (*See* Almbaugh, col. 2, lines 39-42)

b. a device for getting a location information denoting a resent [sic] position of said portable terminal

568. Almbaugh discloses that the travel guide includes a GPS receiver for determining the present position of the device. For example:

> Travel guide device 200 includes a GPS receiver 202, which may be a commercially available GPS receiver providing GPS coordinates for a current location over a standardized interface.
>
> (*See* Almbaugh, col. 2, lines 49-50)

569. The GPS receiver is also illustrated in Figure 2, reproduced with annotation below.

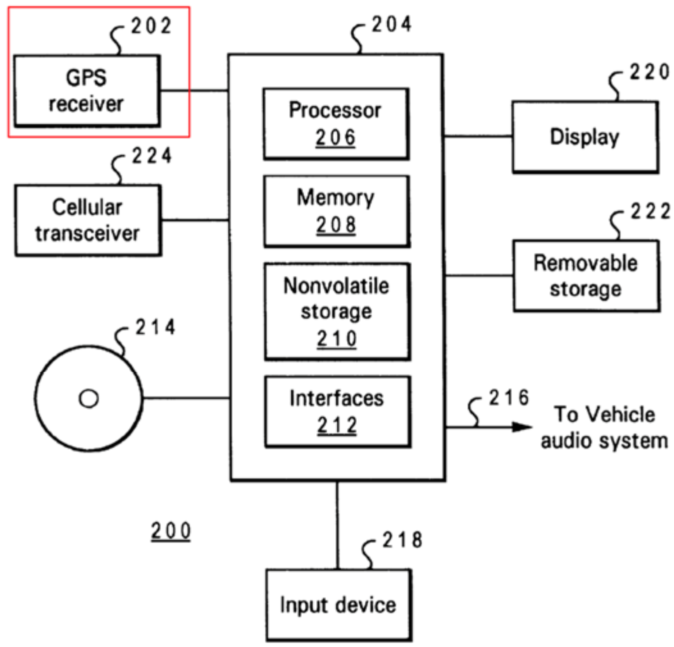


Fig. 2

570. Almbaugh also describes a navigation process that includes using the GPS receiver to determine the current location of the device. For example:

> The process then passes to step 342, which illustrates ***retrieving the GPS coordinates for the current location***.
>
> (*See* Almbaugh at col. 9, lines 33-35, *emphasis added*)

571. This is also illustrated in Figure 3H, reproduced with annotation in connection with the next claim element below.

c. a device for getting direction information denoting an orientation of said portable terminal

572. Almbaugh describes that the device determines the direction of travel, for example using GPS information. For example:

> One functional feature of a travel guide device of the present invention which may be selected by the user in the process described above is a narration function, in which the vehicle location, ***direction of travel***, speed, and/or altitude, is ascertained to an acceptable accuracy from data received by the GPS receiver, or from information derived from that data.
>
> (*See* Almbaugh, col 4, lines 6-12, *emphasis added*)

> Knowing the location of a vehicle, determined within an acceptable accuracy from the GPS coordinates retrieved from the GPS receiver, the travel guide device may identify the latitude and longitude, altitude, ***direction of travel*** and speed of travel at any given instant.
>
> (*See* Almbaugh, col. 6, lines 49-53, *emphasis added*)

573. Almbaugh also describes calculating the direction for the arrow on the display to point so that it is pointed at the destination. This is illustrated (together with determining the current position of the device) in Figure 3H, reproduced with annotation below.

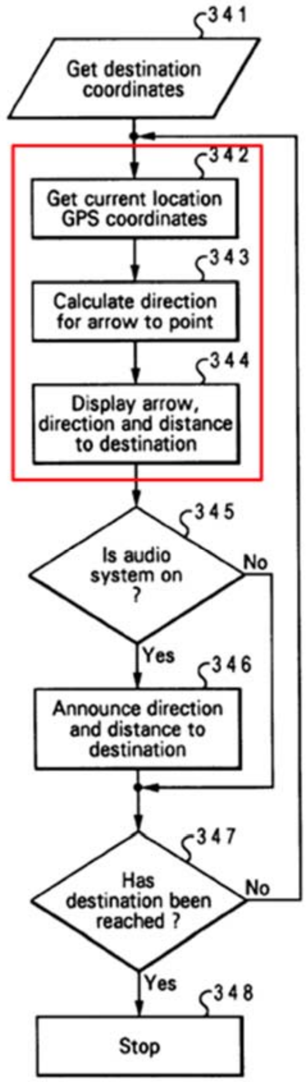


Fig. 3H

574. According to Almbaugh, determining direction may include determining the azimuth of the device. For example:

> The process passes next to step 343, which depicts ***calculating the direction for the arrow to point*** on a display (which may involve simply ***computing the azimuth to the desired destination***), and then to step 344, which illustrates displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
>
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

575. A PHOSITA would understand that the azimuth of a device is the orientation of the device in terms of compass direction. For example, the McGraw Hill Electronics Dictionary[6] defines "azimuth" as "bearing", and defines "bearing" as: "angular position in a horizontal plane, expressed as the angle in degrees from true north in a clockwise direction. Also called azimuth. In navigation, azimuth and bearing have the same meaning, however bearing is preferred for terrestrial navigation, and azimuth for celestial navigation." A PHOSITA would also understand that to display the azimuth direction to the destination using an arrow on the device display, the system would also need to determine the orientation of the device.

576. In addition, Almbaugh describes that the device may provide navigational directions that include an indication of the direction of landmarks relative to the user. For example:

> An arrow on the display points in the general direction of the destination, and text on the display and/or sound from the audio system indicates:
>
> "The destination is about two miles ahead and to the left of your current location."
>
> (*See* Almbaugh col. 9, line 67 to col. 10, line 4)

[6] McGraw Hill Electronics Dictionary, 6th Edition, by Neil Sclater and John Markus, © McGraw Hill, Inc., 1997, ISBN0-07-057837-0, pages 32, and 40.

577. A PHOSITA would understand that in order to make the statement ""The destination is about two miles ahead *and to the left of your current location*", the device must necessarily be able to determine the current direction of travel, otherwise it would not know if the destination was on the left or right.

d. an input device for inputting a destination

578. Almbaugh describes using an input device such as a keyboard or a mouse to activate selected features of the device. For example:

> Travel guide device 200 also includes an input device 218 permitting a user to selectively activate travel guide device or actuate selected features of operation. Input device 218 may be a ***keyboard, mouse, or other standard input device*** for a conventional data processing system, or may be dedicated switches or control buttons. As noted earlier, travel guide device 200 may optionally include at least one display 220, which may be integrated with input device 218 in the form of a touch-screen input/display device.
>
> (*See* Almbaugh at col. 3, lines 31-39, *emphasis added*)

579. This input device is also illustrated in Figure 2, reproduced with annotation below.

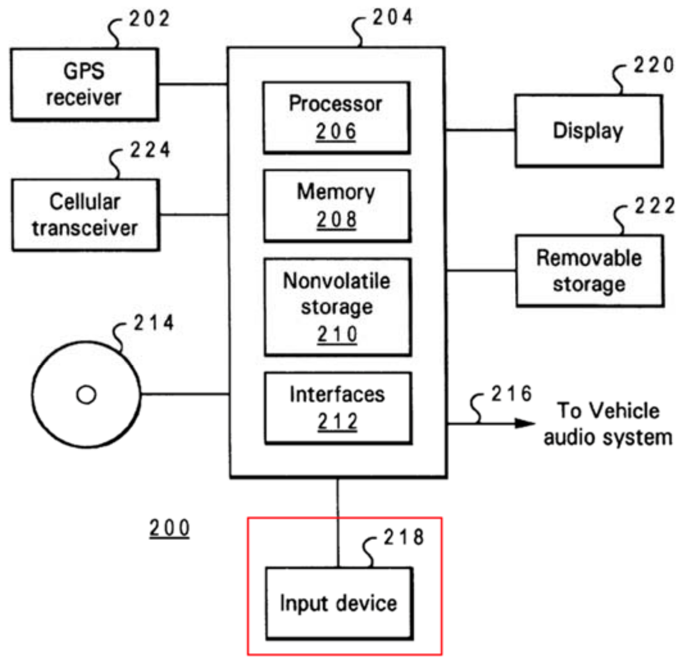


Fig. 2

580. Almbaugh also describes entering the coordinates of the destination either manually, or by selecting the location of the destination on the map display. For example:

> The process begins at step 341, which depicts retrieval of the GPS coordinates for a desired destination. ***The destination coordinates may be manually entered or ascertained from data within the travel guide device, such as a digitally encoded map indexed by GPS coordinates***.
>
> (*See* Almbaugh col. 9, lines 29-33, *emphasis added*)

581. In addition, Almbaugh describes looking up coordinates for the desired destination using a directory or a web site. For example:

> The ***destination GPS coordinates may be looked up from a directory***, or retrieved from a World Wide Web site maintained

> by the destination enterprise and including the GPS coordinate information in a recognizable format. Thus, ***the user may enter destination coordinates directly from a Web site***.
>
> (*See* Almbaugh at col. 9, lines 62-67)

582. A PHOSITA would understand that in order to "enter coordinates directly from a web site", the user would use an input device such as a keyboard or a mouse, as described earlier, or a touch screen. For example:

> As noted earlier, travel guide device 200 may optionally include at least one display 220, which may be ***integrated within input device 218 in the form of a touch-screen input/display device***.
>
> (*See* Almbaugh at 3:36-39, *emphasis added)*

e. a display

583. Almbaugh describes that the travel guide device includes a display. For example:

> As noted earlier, ***travel guide device 200 may optionally include at least one display 220***, which may be integrated within input device 218 in the form of a touch-screen input/display device.
>
> (*See* Almbaugh at 3:36-39, *emphasis added)*

584. The display is also illustrated in Figure 2, reproduced with annotation below.

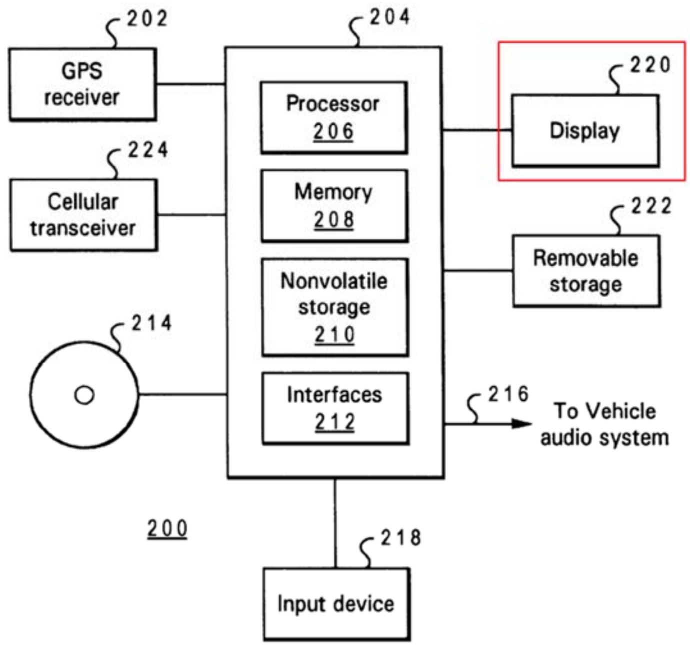


Fig. 2

f. wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination"

585. Almbaugh describes calculating the direction for the arrow on the display to point so that it is pointed at the destination. This is illustrated (together with determining the current position of the device) in Figure 3H, reproduced with annotation below.

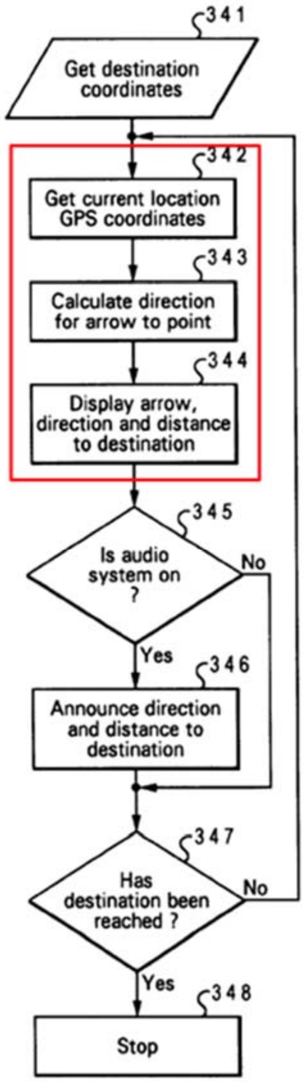


Fig. 3H

586. According to Almbaugh, determining direction may include determining the azimuth of the device. For example:

> The process passes next to step 343, which depicts ***calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination),*** and then to step 344, which illustrates displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
>
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

587. A PHOSITA would understand that the azimuth of a device is the orientation of the device in terms of compass direction. For example, the McGraw Hill Electronics Dictionary[7] defines "azimuth" as "bearing", and defines "bearing" as: "angular position in a horizontal plane, expressed as the angle in degrees from true north in a clockwise direction. Also called azimuth. In navigation, azimuth and bearing have the same meaning, however bearing is preferred for terrestrial navigation, and azimuth for celestial navigation." A PHOSITA would also understand that "the "*said direction*" is the orientation of the device, i.e. the azimuth of the device relative to true north, and the "*azimuth to the desired destination*" is the azimuth direction from the present place to the destination. A PHOSITA would further understand that in order to "display arrow, direction and distance" (*See* figure 3H, *above*), the device would need to compute the direction of the destination *relative* to the device (i.e., "a relation of said direction and a direction from said present place to said destination"), so that the arrow could be properly displayed.

[7] McGraw Hill Electronics Dictionary, 6th Edition, by Neil Sclater and John Markus, © McGraw Hill, Inc., 1997, ISBN0-07-057837-0, pages 32, and 40.

g. said display changes according to a change of said direction of said portable terminal orientation for walking navigation

588. As described above, Almbaugh describes displaying the direction from the device to the destination using an arrow. This is illustrated in Figure 3H, reproduced with annotation below.

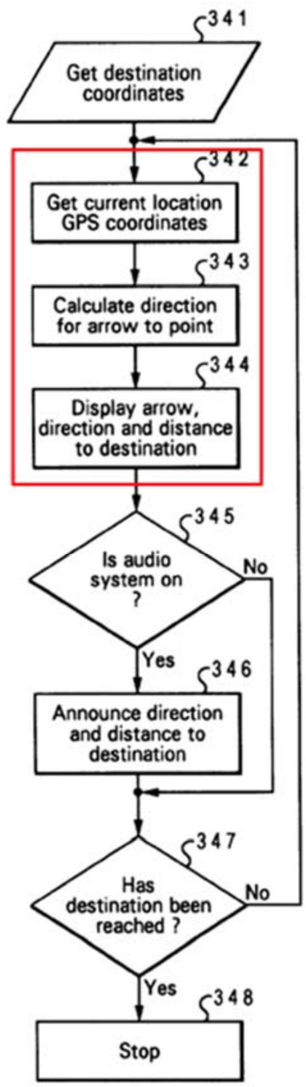


Fig. 3H

589. A PHOSITA would understand that in order to "display arrow, direction and distance" (*See* figure 3H, *above*), the device would need to compute the direction

of the destination *relative* to the device (i.e., "a relation of said direction and a direction from said present place to said destination"), and that, if the orientation of the device were to change, the direction of the destination relative to the orientation of the device would also change, thus the display would change "according to a change of said direction of said portable terminal orientation".

590. Almbaugh also discloses that the travel guide may be used, by a user while walking. For example:

> Although depicted as being utilized in conjunction with a vehicle, the travel guide device has application in a variety of modes of travel, including land-based vehicles (passenger vehicles, off-road vehicles, etc.), aircraft, boats, transportation by animal and walking."
>
> (*See* Almbaugh, col. 2, lines 39-42)

591. I note that while Almbaugh describes that the device is "depicted as being utilized in conjunction with a vehicle", he specifically describes that it may also be applied in cases where the user is walking. Because Almbaugh does not require that a single instance of the device be capable of serving in both applications it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

ii. Claim 2

a. A portable terminal according to claim 1, wherein said direction from said present place to said inputted destination is denoted with an orientation of line"

592. Claim 2 depends from Claim 1 and adds the further limitation "wherein said direction from said present place to said inputted destination is denoted with an orientation of line"

593. As described above, Almbaugh anticipates Claim 1.

594. As described above in connection with Claim 1, Almbaugh describes displaying the direction from the device to the destination using an arrow. This is illustrated in Figure 3H, reproduced with annotation below.

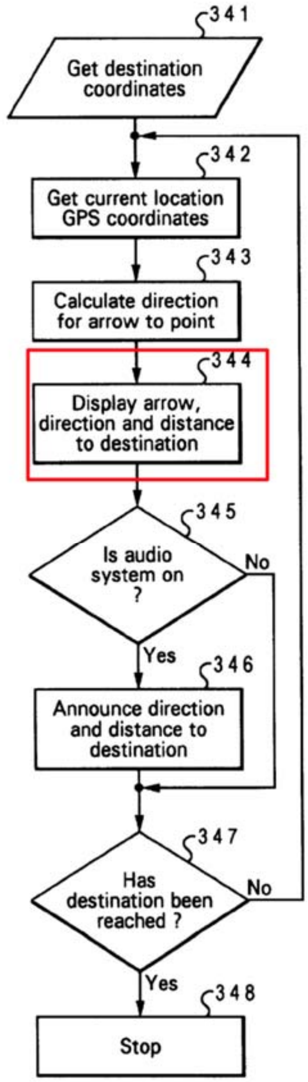


Fig. 3H

595. A PHOSITA would understand that an arrow is a line with a pointer (an arrow *head*) on the end in the direction that is being indicated.

iii. Claim 3

a. A portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number

596. Claim 3 depends from Claim 1 and adds the further limitation "wherein a distance between said present place and said destination is denoted with a number"

597. As described above, Almbaugh anticipates Claim 1.

598. As described above in connection with Claim 1, Almbaugh describes displaying the direction from the device to the destination using an arrow, and providing direction and distance to the destination. This is illustrated in Figure 3H, reproduced with annotation below.

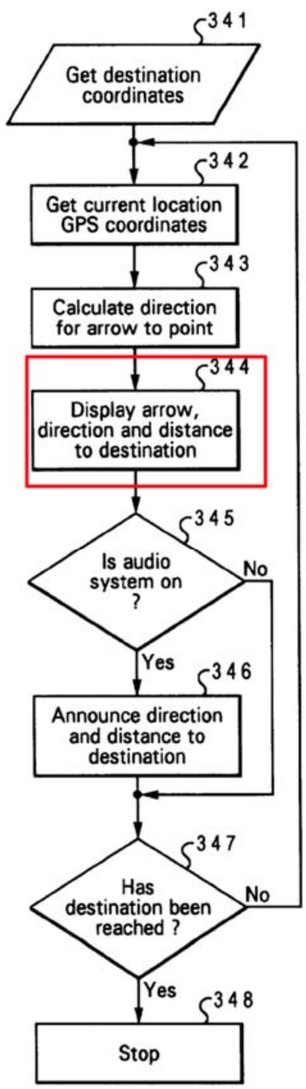


Fig. 3H

599. According to Almbaugh, the direction and distance are also displayed as text. For example:

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates displaying the arrow on a display device, ***optionally with text indicating the direction and distance to the desired destination***.
>
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

iv. Claim 6

600. Claim 6 is an independent Claim.

a. A portable terminal, comprising

601. As described in connection with Claim 1, above, Almbaugh discloses this element.

b. a device for getting a location information denoting a present place of said portable terminal

602. As described in connection with Claim 1, above, Almbaugh discloses this element.

c. a device for getting direction information denoting an orientation of said portable terminal

603. As described in connection with Claim 1, above, Almbaugh discloses this element.

d. a device connected to a server;

604. Almbaugh describes that the travel guide device includes a cellular transceiver for communicating with other data sources. For example:

> ***Travel guide device may further include cellular transceiver 224*** for contacting emergency services or ***receiving updates to database 214, or performing other functions as described below***.
>
> (*See* Almbaugh, col. 3, lines 44-47, *emphasis added*)

605. This communication device is illustrated in Figure 2, reproduced with annotation below.

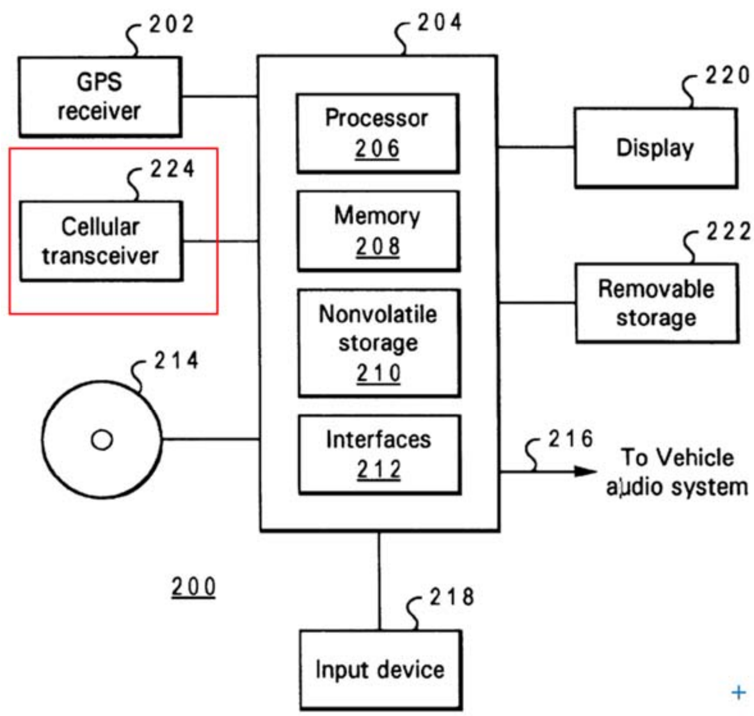


Fig. 2

606. Almbaugh further describes that the user may use the device to "download directories, or to "access world wide web sites".

> FIG. 3K depicts a process for utilizing the communications function of the travel guide device of the present invention. ***The travel guide device includes an interface to a cellular phone or other mobile communications device, or a cellular modem***. Communications systems outside the vehicle in which the travel guide device is being utilized may thus be ***contacted to download directories, access World Wide Web sites, etc***.
>
> (*See* Almbaugh at col. 11, lines 17-24, *emphasis added*)

> The directory may be maintained manually and/or updated automatically over the communications facilities of the travel guide device. For example, ***cellular communications service providers within a given area may automatically establish a communications link to the travel guide device as it enters a defined service area and transmit a local directory to the travel guide device***.
>
> (*See* Almbaugh col. 3, lines 36-39, *emphasis added*)

607. A PHOSITA would understand that a web site is hosted on a server, and that contacting a web site from a device includes connecting the device to the server.

608. For example, the McGraw Hill Electronics Dictionary[8] defines "World Wide Web" as:

> A service provided to personal computer users with appropriate software installed and a high-speed modem. It provides a wide

---

[8] McGraw Hill Electronics Dictionary, 6th Edition, by Neil Sclater and John Markus, © McGraw Hill, Inc., 1997, ISBN0-07-057837-0, page 519.

> selection of text files, graphics and audio for commercial promotion, sales, and educational purposes. ***Specific sites can be found on the network of servers*** and accessed by *hypertext* links.

609. I note that, in my opinion this claim element is indefinite because it is a means-plus-function term, and the '317 patent specification lacks a description of the structure for this element. However, to the extent that the Court's tentative construction is applied, or to the extent that the term is accorded it's plain and ordinary meaning, Almbaugh describes a device connected to a server using a wireless communications link, and this comports with either the Plaintiffs or the Court's constructions.

e. "a display"

610. As described in connection with Claim 1, above, Almbaugh discloses this element.

f. wherein said device connected to said server outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server

611. As described above in connection with Claim 1 above, Almbaugh describes displaying the direction from the device to the destination using an arrow, and providing direction and distance to the destination using text. This is illustrated in Figure 3H, reproduced with annotation below.

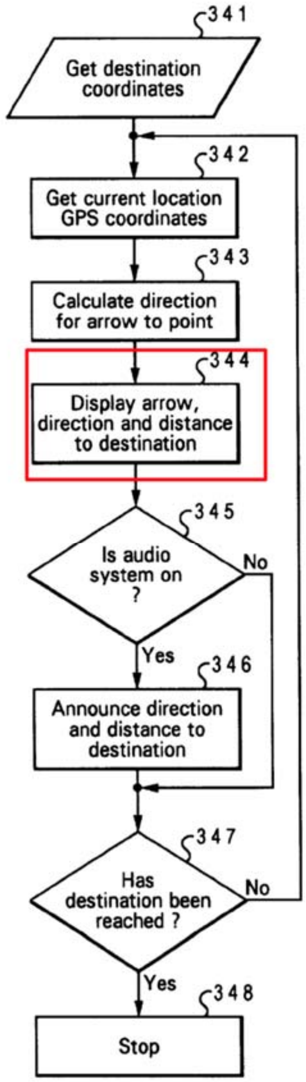


Fig. 3H

612. According to Almbaugh, the direction and distance are also displayed as text. For example:

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates ***displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination***.
>
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

g. and said display displays said retrieved information"

613. As described above, Almbaugh describes obtaining directory information from a remote server, for example using the World Wide Web, For example:

> The ***directory may be maintained manually and/or updated automatically over the communications facilities of the travel guide device***. For example, cellular communications service providers within a given area may automatically establish a communications link to the travel guide device as it enters a defined service area and ***transmit a local directory to the travel guide device.***
>
> (*See* Almbaugh col. 3, lines 36-39, *emphasis added*)

614. Almbaugh further describes that this directory information, for example information about nearby "points of interest", retrieved from the server is then displayed. For example:

> The travel guide device database may include a directory of locations (including GPS coordinates) for number of places such as: hotels and other places of lodging; restaurants and other places to eat; points of interest' medical facilities, pharmacies, and the like; and other subscribing locations.
>
> (See Almbaugh col. 10, lines 16-21)

> The process begins at step 349, which illustrates determination of a "range" (radial distance) of ***locations surrounding a current position to be displayed***. The range may be user selected or automatically adjusted ***based on the number of directory entries retrieved*** for a specific range value. The process then passes to ***step 351, which depicts displaying all directory locations within the specified range***."

(*See* Almbaugh, col. 10, lines 31-40, *emphasis added*)

v. Claim 7

a. A portable terminal according to claim 6, wherein said information is stores or roads information

615. Claim 7 depends from Claim 6 and adds the further limitation "wherein said information is stores or roads information".

616. As described above, Almbaugh anticipates Claim 6.

617. Almbaugh describes a variety of "points of interest", including information about stores. For example:

> The travel guide device database may include ***a directory of locations*** (including GPS coordinates) for ***a number of places*** such as: hotels and other places of lodging; ***restaurants*** and other places to eat; ***points of interest;*** medical facilities, ***pharmacies***, and the like; and other subscribing locations."
>
> (*See* Almbaugh col. 10, lines 16-21, *emphasis added*)

618. A PHOSITA would understand that a pharmacy, for example, is a type of store, and the term "points of interest" includes facilities such as stores.

vi. Claim 8

a. A portable terminal according to claim 6, wherein said display displays said retrieved information as lists

619. Claim 8 depends from Claim 6 and adds the further limitation "wherein said display displays said retrieved information as lists".

620. As described above, Almbaugh anticipates Claim 6.

621. Almbaugh describes that the information, for example, retrieved from the World Wide Web server, includes a director of locations. For example:

> The travel guide device database may include a directory of locations (including GPS coordinates) for number of places such as: hotels and other places of lodging; restaurants and other places to eat; points of interest; medical facilities, pharmacies, and the like; and other subscribing locations.
>
> (*See* Almbaugh col. 10, lines 16-21)

622. Almbaugh further describes that this directory may be presented in the form of a list. For example:

> The directory function of the travel guide device allows a user to ***view a list of directory entries for locations within a defined range of the user's current position***.
>
> (*See* Almbaugh col. 10, lines 64-66, *emphasis added*)

vii. Claim 15

623. Claim 15 depends from Claim 1 and adds the further limitations "a device for retrieving a route from said present place to said destination", and "wherein said display displays said route and displays a direction of movement by the arrow."

624. As described above, Almbaugh anticipates Claim 1.

a. A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination

625. Almbaugh describes collecting waypoints as the user travels a route, and then subsequently retracing the route by displaying these stored waypoints in sequence, with lines connecting them. For example:

> Waypoints reflecting an essentially straight line of travel are compressed into end points defining the straight line. The tolerance parameters for determining what comprises a "straight" line are also user selectable values. Whenever the GPS signal is lost for a significant number of collection intervals, a LOS notation is made in the waypoint table. ***Subsequent display of the route taken from the waypoint table may include a straight, dotted line connecting the last waypoint stored before loss of signal and the first waypoint stored after recovery of the signal, optionally with an appropriate notation indicating loss of signal***.
>
> (*See* Almbaugh col. 8, lines 54-63, *emphasis added*)

> If the data derived from the newly collected waypoint indicates "straight" line travel, the process proceeds to step 337, which indicates placing a new straight line end point into the table, replacing the last previous waypoint. The process then returns to step 330 for retrieval of a new GPS coordinates reading. ***If the data does not indicate straight line travel within the defined acceptable variation, the process proceeds instead to step 338, which depicts adding a new waypoint to the table.***
>
> (*See* Almbaugh col. 8, lines 10-20, *emphasis added*)

626. Almbaugh also describes that this "itinerary" could be planned (i.e. in advance) as opposed to "preformed"

> Preferably, it includes means enabling local multimedia information to be recorded and played back, together with means ***enabling a planned or a performed itinerary to be recorded and displayed, in particular with its characteristics times, distances, and changes in altitude***.
>
> (*See* Almbaugh col. 2, lines 16-21, *emphasis added*)

627. Almbaugh described, for example that a stored route may be retraced, that is retrieved from storage and displayed so that the user can retrace a previously followed route. For example:

> The general directions navigation option may be employed to retrace a route previously taken and documented by automatic waypoint collection as previously described. ***The destination arrow and directions are simply computed for each waypoint, with the next waypoint being selected as a new destination when a current waypoint is reached***
>
> (*See* Almbaugh col. 10, lines 8-14, *emphasis added*)

628. A PHOSITA would understand that in order for a sequence of stored waypoints to be retraced, they would first need to be retrieved.

b. wherein said display displays said route and displays a direction of movement by the arrow

629. Almbaugh describes that the route is displayed using arrows linking each waypoint to the next.

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates displaying

> the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
>
> (*See* Almbaugh col. 9, lines 35-41)
>
> The general directions navigation option may be employed to retrace a route previously taken and documented by automatic waypoint collection as previously described. ***The destination arrow and directions are simply computed for each waypoint, with the next waypoint being selected as a new destination when a current waypoint is reached***
>
> (*See* Almbaugh col. 10, lines 8-14, *emphasis added*)

viii. Claim 16

a. A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route.

630. Claim 16 depends from Claim 15, which depends from Claim 1 and adds the further limitation "wherein said display further displays said grid information of said route"

631. As described above, Almbaugh anticipates Claim 1 and Claim 15.

632. As described elsewhere in this report, in my opinion Claim 16 is invalid for indefiniteness and lack of written description. However, to the extent that it is determined that "said grid information" is road grid information, then Almbaugh describes this. For example, Almbaugh describes displaying the directions arrow superimposed on a map within the display.

> The arrow displayed to indicate the direction of a desired

> location may be superimposed on a digitally encoded map within the display.
> (*See* Almbaugh, col. 9, lines 54-56)

ix. Claim 17

633. Claim 17 depends from claim 15, which depends from Claim 1 and adds the further limitation "wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route"

634. As described above, Almbaugh anticipates Claim 1 and Claim 15.

a. A portable terminal with walking navigation according to claim 15, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route

635. Almbaugh describes collecting waypoints as the user travels a route using a technique wherein collected waypoints that lie on a straight line are "compressed by discarding intermediate waypoints and only storing the first and last waypoints on the straight line. For example:

> If a minimum distance has been traveled since the last waypoint was collected, the process proceeds instead to step 336 depicted in FIG. 3G, which illustrates a determination of whether the collected waypoint lies on a straight line with two previous waypoints. This may be determined by computing the azimuth between the newly collected waypoint and the last previous waypoint, computing the azimuth between the last two previous

> waypoints, and comparing the two azimuths. A small range of variation, such as 1 ° or less, may be tolerated in determining that the newly collected waypoint lies in a "straight" line with immediately preceding waypoints.
>
> (See Almbaugh col. 7 line 67 to col. 8, line 7)

> Waypoints reflecting an essentially straight line of travel are compressed into end points defining the straight line. The tolerance parameters for determining what comprises a "straight" line are also user selectable values. Whenever the GPS signal is lost for a significant number of collection intervals, a LOS notation is made in the waypoint table.
>
> (*See* Almbaugh col. 8, lines 54-58)

636. Thus, because waypoints that lie in a straight line are not compressed (that is, the intermediate waypoints are discarded), the waypoint table will *only* contain the locations of waypoints that do *not* fall in a straight line.

> ***If the data does not indicate straight line travel within the defined acceptable variation, the process proceeds instead to step 338, which depicts adding a new waypoint to the table.***
>
> (*See* Almbaugh col. 8, lines 15-20, *emphasis added*)

637. This is also illustrated in Figure 3G, reproduced below.

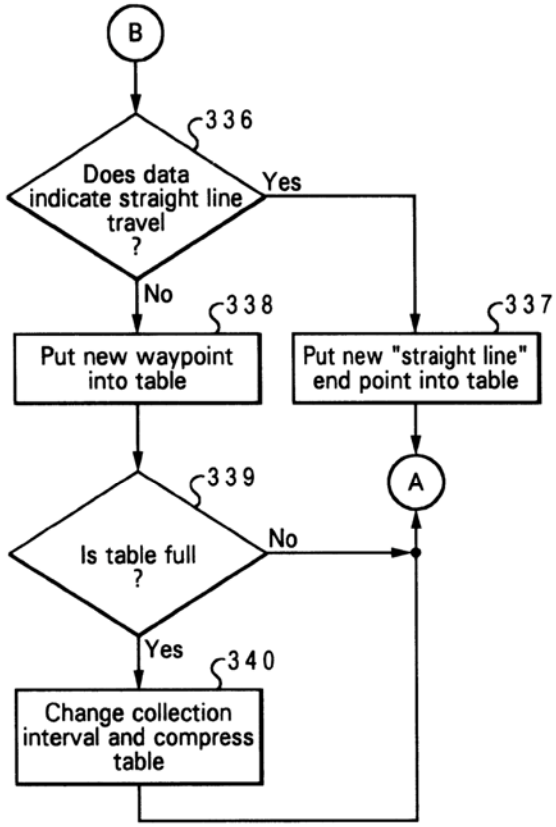


Fig. 3G

638. In addition, Almbaugh describes that if the GPS signal is lost, a loss of signal (LOS) entry is made in the table, and subsequently, when the route is displayed, a dotted line will be used to link the "waypoint stored before loss of signal and the first waypoint stored after recovery of the signal". For example***:***

> Whenever the GPS signal is lost for a significant number of collection intervals, a LOS notation is made in the waypoint table. ***Subsequent display of the route taken from the waypoint table may include a straight, dotted line connecting the last waypoint stored before loss of signal and the first waypoint stored after recovery of the signal, optionally with an appropriate notation indicating loss of signal***.

> (*See* Almbaugh col. 8, lines 54-63, *emphasis added*)

639. And as described in connection with Claim 16, Almbaugh describes displaying a route using lines linking consecutive waypoints retrieved from a waypoint table.

> The general directions navigation option may be employed to retrace a route previously taken and documented by automatic waypoint collection as previously described. The destination arrow and directions are simply computed for each waypoint, with the next waypoint being selected as a new destination when a current waypoint is reached.

640. (*See* Almbaugh, col. 10, lines 8-14)

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
>
> (See Almbaugh Col. 9, lines 35-41)

641. A PHOSITA would understand that, since the stored waypoints are not on a "straight line", the resulting path between waypoints, the line formed by linking consecutive waypoints will be "bent"

x. Claim 20

642. Claim 20 depends from claim 17, which depends from Claim 15, which depends from Claim1 and adds the further limitation “wherein said display

displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route"

643. I note that Claim 20 does not add any additional subject matter to Claim 17, but merely repeats the same added limitation.

a. A portable terminal with walking navigation according to claim 17, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route.

644. Claim 20 depends from Claim 17, which depends from Claim 15, which depends from Claim 1, and adds the further limitation "wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route".

645. For the same reasons presented above in relation to Claim 17, this claim is also invalid.

K. Claims 1-3, 15-17, and 20 of the '317 Patent are Rendered Obvious by Almbaugh in Combination with Colley

646. In my opinion Almbaugh in combination with Colley renders obvious Claims 1-3, 6-8, 15-17, and 20 of the '317 patent. In the sections below I have laid out the basis for my opinion for the various claim elements.

i. Claim 1

647. Claim 1 is an independent claim.

a. A portable terminal, comprising

648. Almbaugh discloses a travel guide that is described as being portable, that is usable while riding in various vehicles, or, for example, while walking. For example:

> Although depicted as being utilized in conjunction with a vehicle, the travel guide device has application in a variety of modes of travel, including land-based vehicles (passenger vehicles, off-road vehicles, etc.), aircraft, boats, transportation by animal and walking."
>
> (*See* Almbaugh, col. 2, lines 39-42)

649. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian applications, such as hiking. For example:

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that ***embodiments of the invention may be incorporated into almost any type of moving object, system, or simply carried by a person***. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, ***hikers or horseback riders*** may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not."
>
> (*See* Colley, col. 5, lines 31-42, *emphasis added*)

650. Colley describes that the device is specifically related to the display of navigational information to guide a user from their current position to a desired destination. For example:

> The present invention relates to navigation and steering schemes for use in marine, land, and air directional control. More particularly, the present invention relates to the display and expression of position and navigation information in a ***simple and direct format for immediate identification of the user's present location relative to a desired location***.
>
> (*See* Colley, col. 1, lines 7-13, *emphasis added*)

b. a device for getting a location information denoting a resent [sic] position of said portable terminal

651. Almbaugh discloses that the travel guide includes a GPS receiver for determining the present position of the device. For example:

> Travel guide device 200 includes a GPS receiver 202, which may be a commercially available GPS receiver providing GPS coordinates for a current location over a standardized interface.
>
> (*See* Almbaugh, col. 2, lines 49-50)

652. The GPS receiver is also illustrated in Figure 2, reproduced with annotation below.

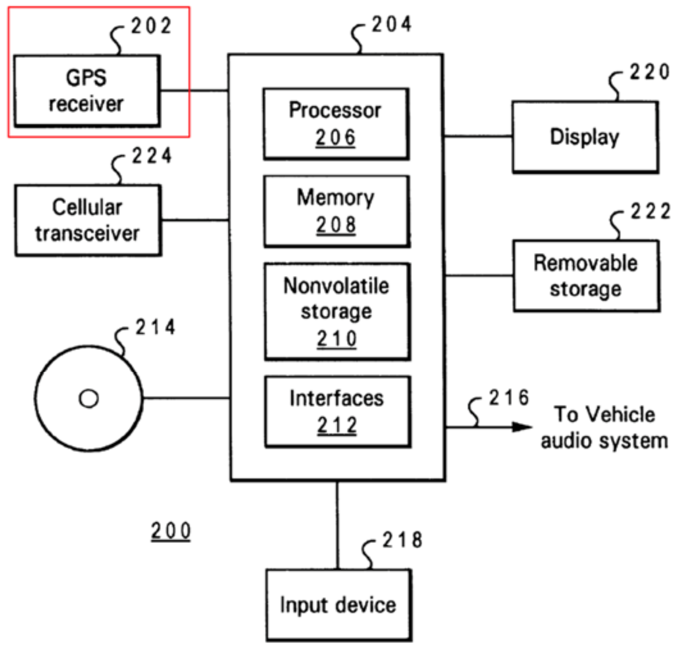


Fig. 2

653. Almbaugh also describes a navigation process that includes using the GPS receiver to determine the current location of the device. For example:

> The process then passes to step 342, which illustrates ***retrieving the GPS coordinates for the current location***.
>
> (*See* Almbaugh at col. 9, lines 33-35, *emphasis added*)

654. This is also illustrated in Figure 3H, reproduced with annotation in connection with the next claim element below.

655. Colley discloses that the navigation and guidance system determines the user's position and course.

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately

> determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley at Abstract)

656. Colley further describes that the user's position can be determined using a GPS receiver. For example:

> For example, when electronic charts are integrated with a ***positioning system such as the global positioning system (GPS),*** the user's position can be displayed in real time on a chart depicting the user's area.
>
> (*See* Colley, col. 1, lines 18-22, *emphasis added*)

> Embodiments of the invention operate with navigation hardware (not shown) which is implemented to ***provide information concerning the user's current position***, the user's COG data, and the position/coordinates of the desired destination. ***For example, the navigation hardware may include a GPS receiver or*** LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer to drive the displays.
>
> (*See* Colley, col. 3, lines 31-38, *emphasis added*)

> Embodiments of the present invention ***utilize data retrieved from a variety of navigation systems, such as the global positioning system (GPS),*** LORAN, inertial navigation, and/or radar systems in conjunction with Point-of-Closest-Approach (PCA) calculations. The PCA is the point along the current course that is closest to a predefined destination.
>
> (*See* Colley, col. 2, line 65 to col. 3, line 4, *emphasis added*)

> ***The user's position and COG are determined by the navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley, col. 2, lines 20-23, *emphasis added*)

c. a device for getting direction information denoting an orientation of said portable terminal

657. Almbaugh describes that the device determines the direction of travel, for example using GPS information. For example:

> One functional feature of a travel guide device of the present invention which may be selected by the user in the process described above is a narration function, in which the vehicle location, ***direction of travel***, speed, and/or altitude, is ascertained to an acceptable accuracy from data received by the GPS receiver, or from information derived from that data.
>
> (*See* Almbaugh, col 4, lines 6-12, *emphasis added*)

> Knowing the location of a vehicle, determined within an acceptable accuracy from the GPS coordinates retrieved from the GPS receiver, the travel guide device may identify the latitude and longitude, altitude, ***direction of travel*** and speed of travel at any given instant.
>
> (*See* Almbaugh, col. 6, lines 49-53, *emphasis added*)

658. Almbaugh also describes calculating the direction for the arrow on the display to point so that it is pointed at the destination. This is illustrated (together with determining the current position of the device) in Figure 3H, reproduced with annotation below.

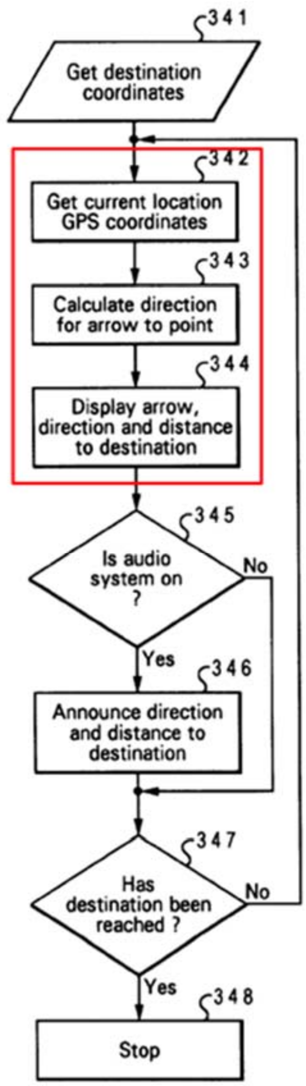


Fig. 3H

659. According to Almbaugh, determining direction may include determining the azimuth of the device. For example:

> The process passes next to step 343, which depicts ***calculating the direction for the arrow to point*** on a display (which may involve simply ***computing the azimuth to the desired destination***), and then to step 344, which illustrates displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
>
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

660. A PHOSITA would understand that the azimuth of a device is the orientation of the device in terms of compass direction. For example, the McGraw Hill Electronics Dictionary[9] defines "azimuth" as "bearing", and defines "bearing" as: "angular position in a horizontal plane, expressed as the angle in degrees from true north in a clockwise direction. Also called azimuth. In navigation, azimuth and bearing have the same meaning, however bearing is preferred for terrestrial navigation, and azimuth for celestial navigation." A PHOSITA would also understand that to display the azimuth direction to the destination using an arrow on the device display, the system would also need to determine the orientation of the device.

661. In addition, Almbaugh describes that the device may provide navigational directions that include an indication of the direction of landmarks relative to the user. For example:

> An arrow on the display points in the general direction of the destination, and text on the display and/or sound from the audio system indicates:
>
> "The destination is about two miles ahead and to the left of your current location."
>
> (*See* Almbaugh col. 9, line 67 to col. 10, line 4)

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[9] McGraw Hill Electronics Dictionary, 6th Edition, by Neil Sclater and John Markus, © McGraw Hill, Inc., 1997, ISBN0-07-057837-0, pages 32, and 40.

662. A PHOSITA would understand that in order to make the statement ""The destination is about two miles ahead *and to the left of your current location*", the device must necessarily be able to determine the current direction of travel, otherwise it would not know if the destination was on the left or right.

663. Colley discloses that the navigation and guidance system determine the user's course and the course required to reach the desired destination from the current position. For example:

> A navigation and guidance system which ***directs a user toward a desired destination***. Position and steering information are integrated into a single display to allow the user to immediately ***determine whether the correct course is being traveled,*** and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation system*** and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley at Abstract, *emphasis added*)

664. Colley refers to the user's COG (Course over Ground), and the user's "track", which a PHOSITA would understand to be the current heading or direction of travel. For example:

> The actual track of the user is displayed relative to the segment waypoints such that the user's actual track is superimposed over the optimum route. The ***user's position and COG are determined by the navigation system*** and indicated on the (*See* Colley, col. 2, lines 18-24, *emphasis added*)

> ***Current commercially available electronic chart display*** implementations typically ***indicate*** relevant geographic features, routes and waypoints, the user's position, ***and the user's track***.
>
> (*See* Colley, col. 1, lines 31-34, *emphasis added*)

665. Colley illustrates this, for example in Figure 1, reproduced below. In this figure, the dotted line 112 corresponds to the user's current track, and the angle of the arrow at the end of this line is the user's direction of travel. For example:

> For example, FIG. 1(a) shows the current implementation in most commercial systems. A desired route with dotted waypoints 102 is indicated by the straight lines 104 which comprise the intended track 114. The destination waypoint is shown as a circled dot 110, and ***the dotted line 112 indicates the user's actual track***. In the example, ***the arrow 116 at the top end of the dotted line 112 shows the user's position and current heading***.
>
> (*See* Colley, col. 1. Lines 45-53, *emphasis added*)

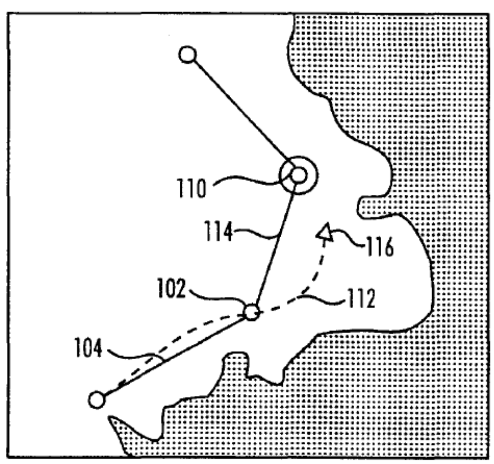

FIG. 1a

Colley FIG. 1a.

d. an input device for inputting a destination

666. Almbaugh describes using an input device such as a keyboard or a mouse to activate selected features of the device. For example:

> Travel guide device 200 also includes an input device 218 permitting a user to selectively activate travel guide device or actuate selected features of operation. Input device 218 may be a ***keyboard, mouse, or other standard input device*** for a conventional data processing system, or may be dedicated switches or control buttons. As noted earlier, travel guide device 200 may optionally include at least one display 220, which may be integrated with input device 218 in the form of a touch-screen input/display device.
>
> (*See* Almbaugh at col. 3, lines 31-39, *emphasis added*)

667. This input device is also illustrated in Figure 2, reproduced with annotation below.

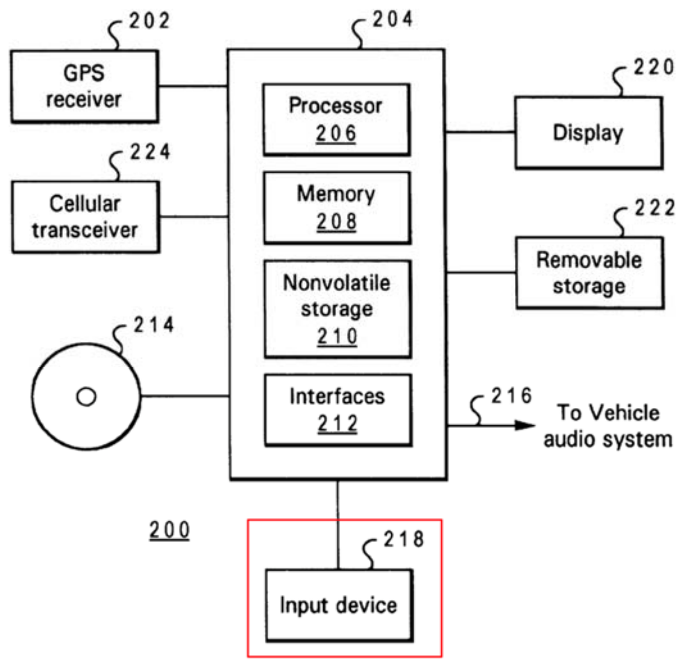

Fig. 2

668. Almbaugh also describes entering the coordinates of the destination either manually, or by selecting the location of the destination on the map display. For example:

> The process begins at step 341, which depicts retrieval of the GPS coordinates for a desired destination. ***The destination coordinates may be manually entered or ascertained from data within the travel guide device, such as a digitally encoded map indexed by GPS coordinates***.
>
> (*See* Almbaugh col. 9, lines 29-33, *emphasis added*)

669. In addition, Almbaugh describes looking up coordinates for the desired destination using a directory or a web site. For example:

> The ***destination GPS coordinates may be looked up from a directory***, or retrieved from a World Wide Web site maintained

> by the destination enterprise and including the GPS coordinate information in a recognizable format. Thus, ***the user may enter destination coordinates directly from a Web site***.
>
> (*See* Almbaugh at col. 9, lines 62-67, *emphasis added*)

670. A PHOSITA would understand that in order to interact with a web site, the user would use an input device such as a keyboard or a mouse, as described earlier, or a touch screen. For example:

> As noted earlier, travel guide device 200 may optionally include at least one display 220, which may be ***integrated within input device 218 in the form of a touch-screen input/display device***.
>
> (*See* Almbaugh at 3:36-39, *emphasis added)*

671. Colley describes that the destination is determined (or input) using the Navigation hardware that "may include a GPS receiver or LORAN receiver, as well as display devices and/or electronic charts, in conjunction with a programmable computer". A PHOSITA would understand that the navigation hardware described by Colley would include a means for inputting the destination, for example by indicating it on an "electronic chart", since the navigation system would not, by itself, have this information. For example:

> Embodiments of the invention operate with ***navigation hardware*** (not shown) which is implemented to provide information concerning the user's current position, the user's COG data, and ***the position/coordinates of the desired destination***. ***For example, the navigation hardware may include a GPS receiver or LORAN receiver, as well as display***

> ***devices and/or electronic charts, in conjunction with a programmable computer to drive the displays***
>
> (*See* Colley, col. 3, line 31-38, *emphasis added)*

> A positioning apparatus for indicating integrated directional and point of closest approach (PCA) information to a user traveling along a current course toward a desired destination, the positioning apparatus operable with a computer and a navigation system providing the user's current position data, destination position data, bearing data, and course-over-ground (COG) data, comprising: ***destination position means for indicating the position of the desired destination***; …
>
> (*See* Colley at Claim 2, *partial excerpt, emphasis added)*

> An integrated steering indicator operable with a programmable computer and a navigation system, the integrated steering indicator for displaying point of closest approach (PCA), route, and position information to a traveling operator, to direct the operator from an origin to a desired destination, the origin and desired destination having an associated origin waypoint and a destination waypoint, respectively, ***the positions of the origin and destination waypoints being determined by the navigation system***, respectively, the integrated steering indicator comprising: an origin waypoint indicator for displaying the position of the origin waypoint; ***a destination waypoint indicator for displaying the position of the destination waypoint relative to the origin waypoint;***…
>
> (*See* Colley at Claim 12, *partial excerpt, emphasis added)*

672. To the extent that it is determined that Colley does not explicitly describe an input device for inputting a destination, A PHOSITA would have found it obvious to use the input device of Almbaugh to allow the user to enter destination

information. In such a combination, each device would be performing the same functions as it was in its original application, and the combination would yield the predictable result of determining a route to a particular destination as described by both Colley and Almbaugh, based on an input by the user, using Almbaugh's input device.

e. a display

673. Almbaugh describes that the travel guide device includes a display. For example:

> As noted earlier, ***travel guide device 200 may optionally include at least one display 220***, which may be integrated within input device 218 in the form of a touch-screen input/display device.
>
> (*See* Almbaugh at 3:36-39, *emphasis added)*

674. The display is also illustrated in Figure 2, reproduced with annotation below.

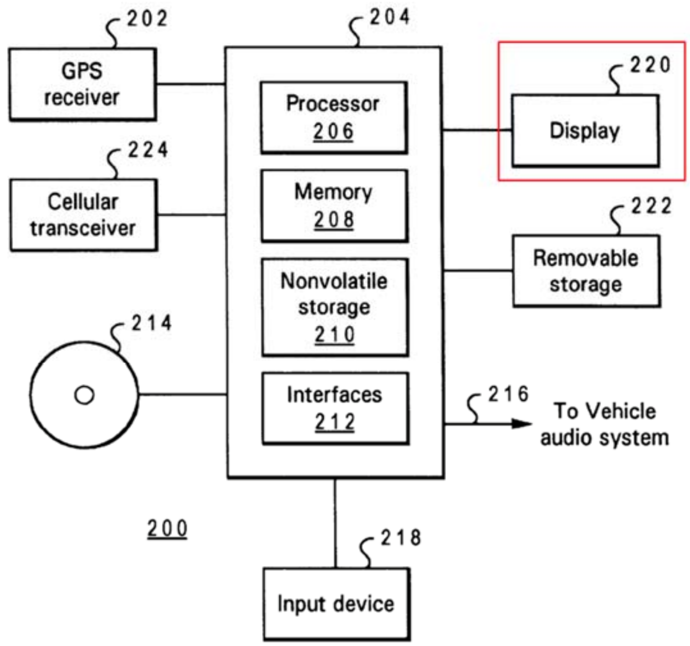

Fig. 2

675. Colley also discloses a display.

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are ***integrated into a single display*** to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. The user's position and course are determined by a navigation system and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley at Abstract, *emphasis added*)

> The desired destination is ***displayed*** on an electronic charting system by a destination waypoint.
>
> (*See* Colley, col. 2, lines 12-14, *emphasis added*)

676. Colley Describes the details of the display in connection with Figure 2, reproduced below.

> The actual track of the user is ***displayed*** relative to the segment waypoints such that the user's actual track is superimposed over the optimum route. The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

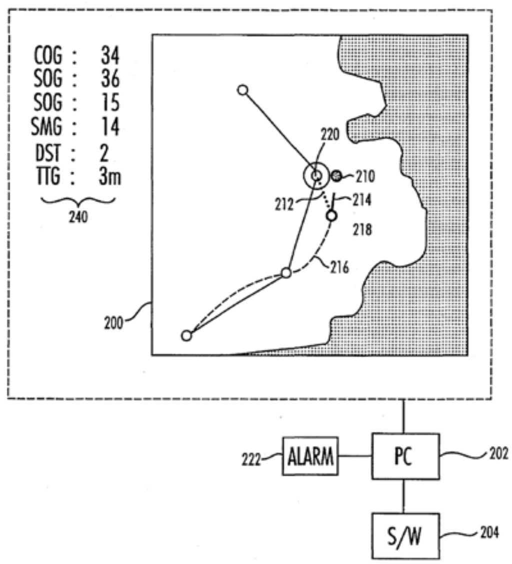

FIG. 2

Colley Figure 2

f. wherein said display displays positions of said destination and said present place, and a relation of said direction and a direction from said present place to said destination"

677. Almbaugh describes calculating the direction for the arrow on the display to point so that it is pointed at the destination. This is illustrated (together with

determining the current position of the device) in Figure 3H, reproduced with annotation below.

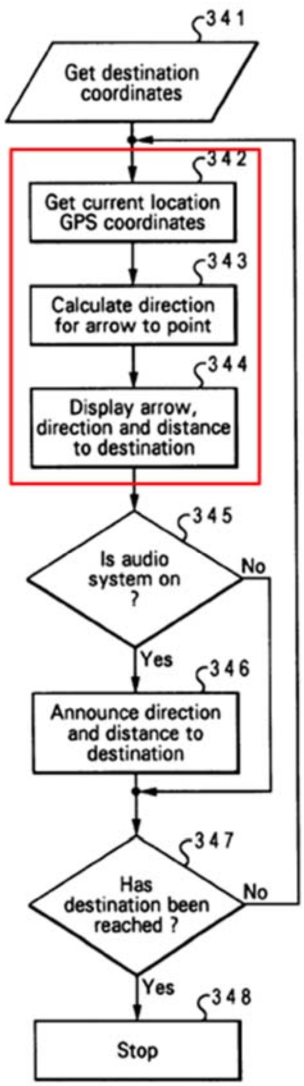

Fig. 3H

678. According to Almbaugh, determining direction may include determining the azimuth of the device. For example:

> The process passes next to step 343, which depicts ***calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination),*** and then to step 344, which illustrates displaying

> the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

679. A PHOSITA would understand that the azimuth of a device is the orientation of the device in terms of compass direction. For example, the McGraw Hill Electronics Dictionary[10] defines "azimuth" as "bearing", and defines "bearing" as: "angular position in a horizontal plane, expressed as the angle in degrees from true north in a clockwise direction. Also called azimuth. In navigation, azimuth and bearing have the same meaning, however bearing is preferred for terrestrial navigation, and azimuth for celestial navigation." A PHOSITA would also understand that "the "*said direction*" is the orientation of the device, i.e. the azimuth of the device relative to true north, and the "*azimuth to the desired destination***"** is the azimuth direction from the present place to the destination. A PHOSITA would further understand that in order to "display arrow, direction and distance" (*See* figure 3H, *above*), the device would need to compute the direction of the destination *relative* to the device (i.e., "a relation of said direction and a direction from said present place to said destination"), so that the arrow could be properly displayed.

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[10] McGraw Hill Electronics Dictionary, 6th Edition, by Neil Sclater and John Markus, © McGraw Hill, Inc., 1997, ISBN0-07-057837-0, pages 32, and 40.

680. Colley discloses a display that "displays positions of said destination and said present place to said destination", and further discloses a display that "displays "a relation of said direction and a direction from said present place to said destination". For example:

> A navigation and guidance system which directs a user toward a desired destination. Position and steering information are integrated into a single display to allow the user to immediately determine whether the correct course is being traveled, and to inform the use of any directional changes which may be necessary to be directed toward the desired destination waypoint. ***The user's position and course are determined by a navigation system and indicated on the display as a directional pointing icon, such as a line or arrow***.
>
> (*See* Colley at Abstract, *emphasis added*)

> Thus, preferably the display 200 shows a graphical representation of numerical data combined with instantaneous course correction information. The actual track 216 of the user is designated as a dotted line. The PCA 210 is shown relative to ***the user's current position 218 and the destination waypoint 220***. *A* ***bearing-to-destination (BTD) indicator 212*** connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint.
>
> (*See* Colley, col. 3, lines 39-47, *emphasis added*)

> More particularly, in FIG. 3, the BTD indicator 212, ***the COG indicator 214,*** and the PCA 210 are illustrated in enlarged detail. As explained above, by combining the steering and navigation indicators into a single, integrated display system 200 (FIG. 2), users can quickly and easily determine their current locations relative to the desired destinations 220, and how to best reach the desired destinations.

(*See* Colley, col. 4, lines 8-15, *emphasis added*)

> The ***user's position and COG are determined by the navigation system and indicated on the display*** as a directional pointing icon, such as a line or arrow.
>
> (*See* Colley col. 2, lines 20-23, *emphasis added*)

681. This is further illustrated in Figures 2 and 3 reproduced below, wherein the destination is labeled item 220, the current position is labeled 218, and the relative direction from the current heading to the destination is shown by the difference in angle between the course over ground (COG) indicator 214, and the bearing-to-destination line 212.

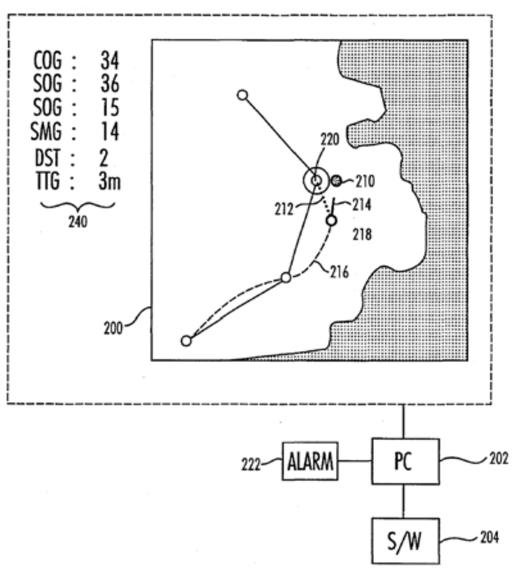

FIG. 2

Colley FIG. 2

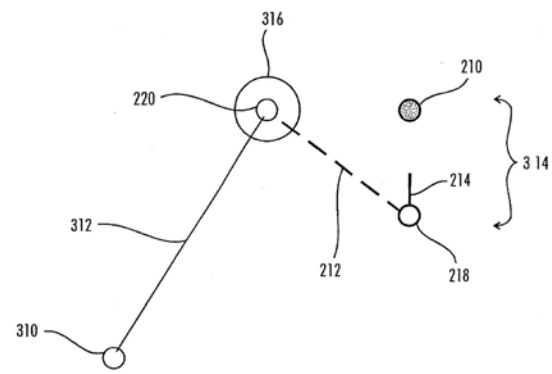

FIG. 3

Colley FIG. 3.

682. To the extent that it is determined that Almbaugh does not explicitly disclose displaying the positions of the destination, the present place and the starting point, A PHOSITA would find it obvious to do so based on the teachings of Colley. Both Almbaugh and Colley describe systems to provide navigational guidance to a user. Almbaugh's focus is on the collection of route information, obtaining route and point of interest information from a remote server, and providing guidance as the user follows that route. Colley's focus is specifically on the display of such guidance information, and, in particular providing an improved display that is more intuitive and more effective at guiding the user to the destination. A PHOSITA implementing the system of Almbaugh would thus be motivated to use this improved display technique described by Colley, and in doing so would be confident that this simple substitution of one known element for another would yield the predictable result of a more intuitive and easily understood guidance display. In this combination, each of the systems would be performing the same

function it had been known to perform (i.e. the waypoint processing functionality of Almbaugh, and the display functionality of Colley) and would yield no more than one would expect from such an arrangement; thus, the combination is obvious.

g. said display changes according to a change of said direction of said portable terminal orientation for walking navigation

683. As described above, Almbaugh describes displaying the direction from the device to the destination using an arrow. A This is illustrated in Figure 3H, reproduced with annotation below.

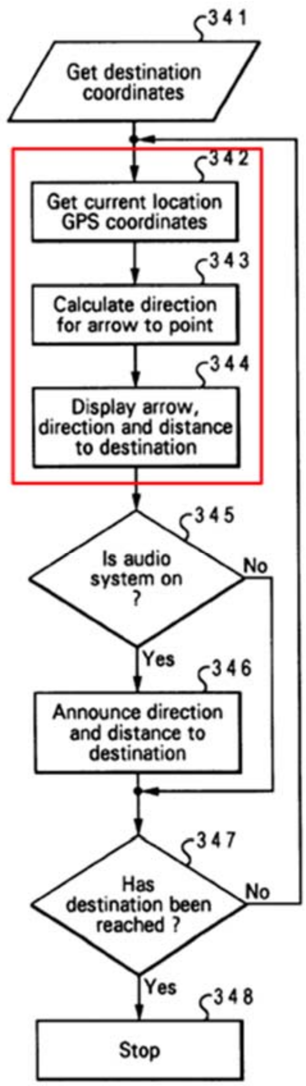

Fig. 3H

684. A PHOSITA would understand that in order to "display arrow, direction and distance" (*See* figure 3H, *above*), the device would need to compute the direction of the destination *relative* to the device (i.e., "a relation of said direction and a direction from said present place to said destination"), , and that, if the orientation of the device were to change, the direction of the destination relative to the orientation of the device would also change, thus the display would change "according to a change of said direction of said portable terminal orientation".

685. Almbaugh also discloses that the travel guide may be used, by a user while walking. For example:

> Although depicted as being utilized in conjunction with a vehicle, the travel guide device has application in a variety of modes of travel, including land-based vehicles (passenger vehicles, off-road vehicles, etc.), aircraft, boats, transportation by animal and walking."
>
> (*See* Almbaugh, col. 2, lines 39-42)

686. I note that while Almbaugh describes that the device is "depicted as being utilized in conjunction with a vehicle", he specifically describes that it may also be applied in cases where the user is walking. Because Almbaugh does not require that a single instance of the device be capable of serving in both applications it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

687. Colley discloses that "said display changes according to a change of said direction of said portable terminal orientation for walking navigation". For example:

> Accordingly, in preferred embodiments, as the computer and software arrangement continuously determines the COG and BRG values, and ***the corresponding graphical representations are displayed on the steering screen***, the user can manually or automatically direct the PCA indicator 210 toward the destination waypoint 220.
>
> (*See* Colley, col. 4, lines 53-58, *emphasis added*)

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. ***A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), distance to waypoint (DST), and the time to go (TTG).*** The numerical table or listing 240 is optional in that ***the numerical data is embodied by the movement of the graphical icons illustrated in the display 200.*** Accordingly, reference to a numerical coordinates table is unnecessary for steering and position correction or adjustment.
>
> (*See* Colley, col. 3, lines 19-30, *emphasis added*)

688. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian (i.e. "walking") applications, for example hiking.

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that ***embodiments of the invention may be incorporated into almost any type of moving object, system, or simply carried by a person***. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, ***hikers*** or horseback ***riders*** may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not.
>
> (*See* Colley, col. 5, lines 31-42, *emphasis added*)

689. I note that while Colley describes that the device could be "incorporated into almost any type of moving object", he specifically describes it as being "simply carried by a person. Because Colley does not require that a single instance of the

device be capable of serving in both applications it comports with either the defendant's or the plaintiff's constructions of the term "walking navigation".

ii. Claim 2

a. A portable terminal according to claim 1, wherein said direction from said present place to said inputted destination is denoted with an orientation of line"

690. Claim 2 depends from Claim 1 and adds the further limitation "wherein said direction from said present place to said inputted destination is denoted with an orientation of line".

691. As described above, Almbaugh in combination with Colley renders Claim 1 obvious.

692. As described above in connection with Claim 1, Almbaugh describes displaying the direction from the device to the destination using an arrow. This is illustrated in Figure 3H, reproduced with annotation below.

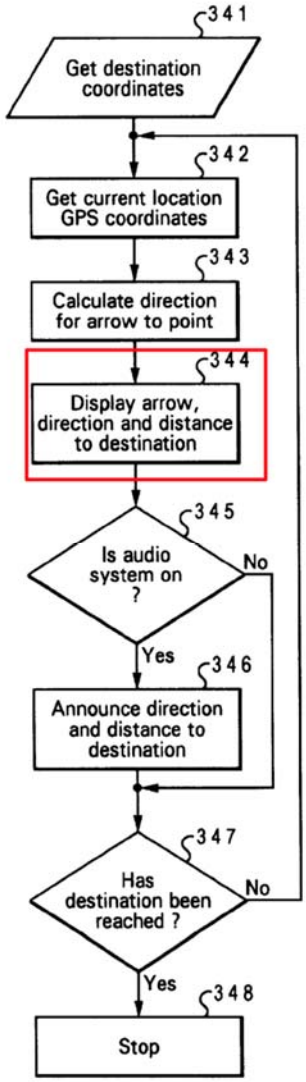

Fig. 3H

693. A PHOSITA would understand that an arrow is a line with a pointer (an arrow *head*) on the end in the direction that is being indicated.

694. Colley describes that the display includes a "bearing-to-destination indicator" that is represented on the display as a dotted line from the current position to the destination. For example:

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. A computer 202 is programmed 204

> to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), distance to waypoint (DST), and the time to go (TTG).
>
> (*See* Colley, col. 3, lines 19-25)

> A bearing-to-destination (BTD) indicator 212 connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint.
>
> (*See* Colley, col. 3, lines 44-47)

695. This is illustrated as item 212 in Figures 2 and 3, reproduced below.

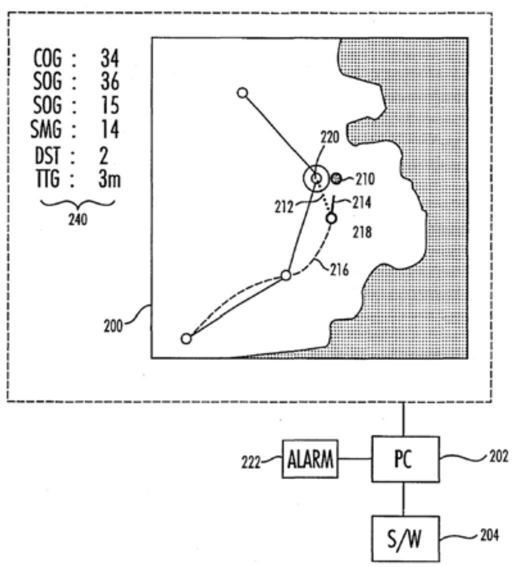

FIG. 2

Colley FIG. 2

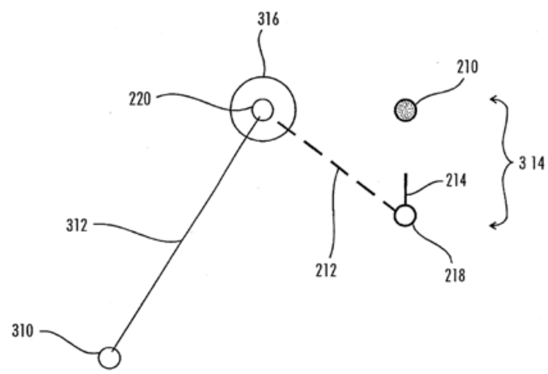

FIG. 3

Colley FIG. 3.

> The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, ***such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

696. To the extent that it is determined that Almbaugh does not explicitly describe denoting (i.e. displaying) the direction to the destination using a line oriented in the direction of the destination, a PHOSITA would find it obvious to do so based on the teachings of Colley. Both Almbaugh and Colley describe systems to provide navigational guidance to a user. Almbaugh's focus is on the collection of route information, obtaining route and point of interest information from a remote server, and providing guidance as the user follows that route. Colley's focus in specifically on the display of such guidance information, and, in particular providing an improved display that is more intuitive and more effective at guiding the user to the destination. A PHOSITA implementing the system of Almbaugh

would thus be motivated to use this improved display technique described by Colley, and in doing so would be confident that this simple substitution of one known element for another would yield the predictable result of a more intuitive and easily understood guidance display. In this combination, each of the systems would be performing the same function it had been known to perform (i.e. the waypoint processing functionality of Almbaugh, and the display functionality of Colley) and would yield no more than one would expect from such an arrangement.

iii. Claim 3

a. A portable terminal according to claim 1, wherein a distance between said present place and said destination is denoted with a number"

697. Claim 3 depends from Claim 1, and adds the further limitation "wherein a distance between said present place and said destination is denoted with a number".

698. As described above, Almbaugh in combination with Colley renders Claim 1 obvious.

699. As described above in connection with Claim 1, Almbaugh describes displaying the direction from the device to the destination using an arrow, and providing direction and distance to the destination. This is illustrated in Figure 3H, reproduced with annotation below.

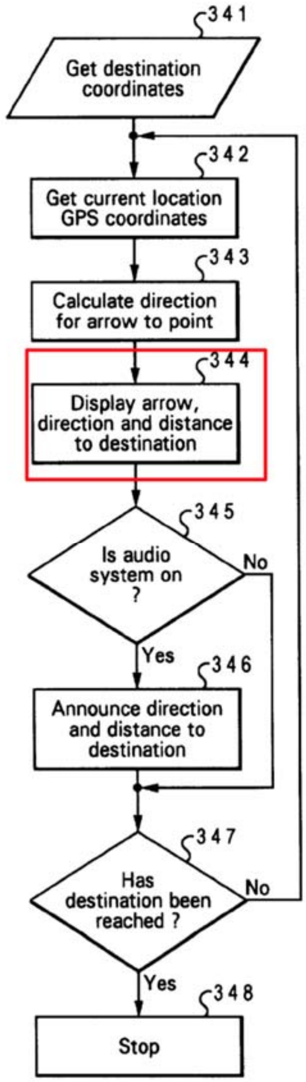

Fig. 3H

700. According to Almbaugh, the direction and distance are also displayed as text. For example:

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates displaying the arrow on a display device, ***optionally with text indicating the direction and distance to the desired destination***.
>
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

701. Colley also describes providing the distance from the current position to the destination as a number. For example:

> As illustrated in the preferred embodiment of FIG. 2, a single display screen 200 is shown. A computer 202 is programmed 204 to drive the position displays 240 including, for example, the course-over-ground (COG) indication, bearing data (BRG), the speed over ground (SOG), speed made good (SMG), ***distance to waypoint (DST)***, and the time to go (TTG). The ***numerical table or listing 240*** is optional in that the numerical data is embodied by the movement of the graphical icons illustrated in the display 200.
>
> (*See* Colley, col. 3, lines 19-28, *emphasis added*)

702. This numerical display of distance is also shown in Figure 2, reproduced below. Here the designator "DST" is used to identify the distance to the destination.

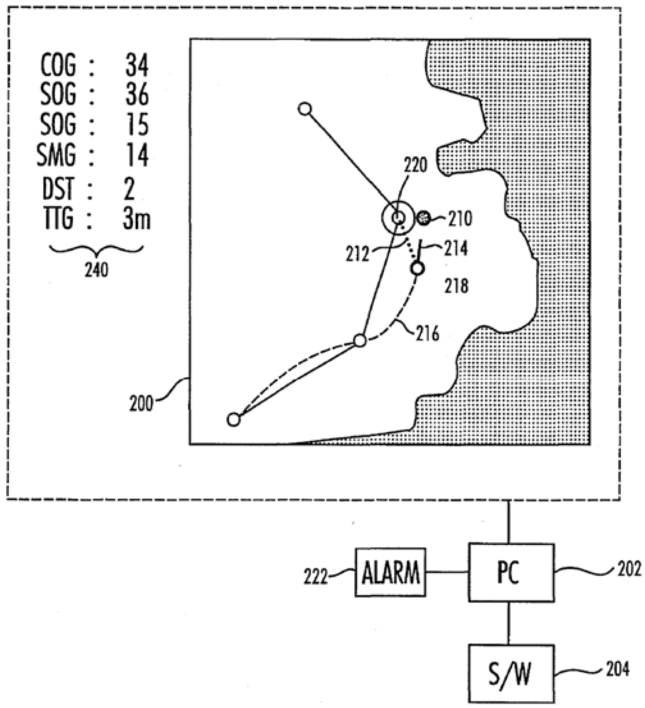

FIG. 2

Colley FIG. 2

iv. Claim 6

703. Claim 6 is an independent Claim.

a. A portable terminal, comprising

704. As described in connection with Claim 1, above, Almbaugh and Colley disclose this element.

b. a device for getting a location information denoting a present place of said portable terminal

705. As described in connection with Claim 1, above, Almbaugh and Colley disclose this element.

c. a device for getting direction information denoting an orientation of said portable terminal

706. As described in connection with Claim 1, above, Almbaugh and Colley disclose this element.

d. a device connected to a server;

707. Almbaugh describes that the travel guide device includes a cellular transceiver for communicating with other data sources. For example:

> ***Travel guide device may further include cellular transceiver 224*** for contacting emergency services or ***receiving updates to database 214, or performing other functions as described below***.
>
> (*See* Almbaugh, col. 3, lines 44-47, *emphasis added*)

708. This communication device is illustrated in Figure 2, reproduced with annotation below.

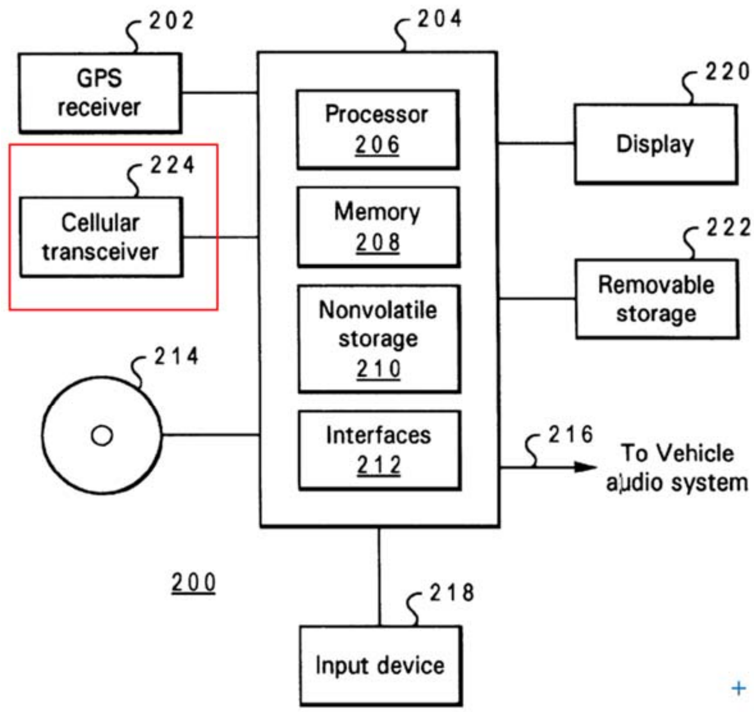

Fig. 2

709. Almbaugh further describes that the user may use the device to "download directories, or to "access world wide web sites".

> FIG. 3K depicts a process for utilizing the communications function of the travel guide device of the present invention. ***The travel guide device includes an interface to a cellular phone or other mobile communications device, or a cellular modem***. Communications systems outside the vehicle in which the travel guide device is being utilized may thus be ***contacted to download directories, access World Wide Web sites, etc***.
>
> (*See* Almbaugh at col. 11, lines 17-24, *emphasis added*)

> The directory may be maintained manually and/or updated automatically over the communications facilities of the travel guide device. For example, ***cellular communications service providers within a given area may automatically establish a***

> ***communications link to the travel guide device as it enters a defined service area and transmit a local directory to the travel guide device***.
>
> (*See* Almbaugh col. 3, lines 36-39, *emphasis added*)

710. A PHOSITA would understand that a web site is hosted on a server, and that contacting a web site from a device includes connecting the device to the server.

711. For example, the McGraw Hill Electronics Dictionary[11] defines "World Wide Web" as:

> A service provided to personal computer users with appropriate software installed and a high-speed modem. It provides a wide selection of text files, graphics and audio for commercial promotion, sales, and educational purposes. ***Specific sites can be found on the network of servers*** and accessed by *hypertext* links.

712. I note that, in my opinion this claim element is indefinite because it is a means-plus-function term, and the '317 patent specification lacks a description of the structure for this element. However, to the extent that the Court's tentative construction is applied, or to the extent that the term is accorded it's plain and ordinary meaning, Almbaugh describes a device connected to a server using a

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[11] McGraw Hill Electronics Dictionary, 6th Edition, by Neil Sclater and John Markus, © McGraw Hill, Inc., 1997, ISBN0-07-057837-0, page 519.

wireless communications link, and this comports with either the Plaintiffs or the Court's constructions.

e. "a display"

713. As described in connection with Claim 1, above, Almbaugh and Colley disclose this element.

f. wherein said device connected to said server outputting said location information and said direction information and receiving retrieved information based on said outputted information at said server

714. As described above in connection with Claim 1 above, Almbaugh describes displaying the direction from the device to the destination using an arrow, and providing direction and distance to the destination using text. This is illustrated in Figure 3H, reproduced with annotation below.

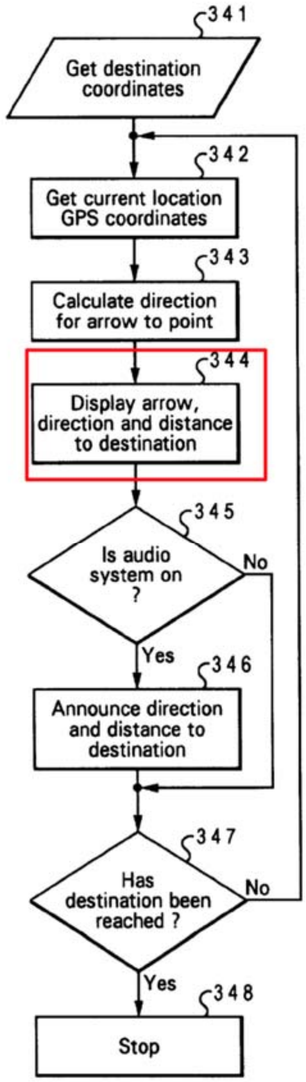

Fig. 3H

715. According to Almbaugh, the direction and distance are also displayed as text. For example:

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates ***displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination***.
>
> (*See* Almbaugh col. 9, lines 35-41, *emphasis added*)

g. and said display displays said retrieved information"

716. As described above, Almbaugh describes obtaining directory information from a remote server, for example using the World Wide Web, For example:

> The ***directory may be maintained manually and/or updated automatically over the communications facilities of the travel guide device***. For example, cellular communications service providers within a given area may automatically establish a communications link to the travel guide device as it enters a defined service area and ***transmit a local directory to the travel guide device.***
>
> (*See* Almbaugh col. 3, lines 36-39, *emphasis added*)

717. Almbaugh further describes that this directory information, for example information about nearby "points of interest", retrieved from the server is then displayed. For example:

> The travel guide device database may include a directory of locations (including GPS coordinates) for number of places such as: hotels and other places of lodging; restaurants and other places to eat; points of interest' medical facilities, pharmacies, and the like; and other subscribing locations.
>
> (See Almbaugh col. 10, lines 16-21)

> The process begins at step 349, which illustrates determination of a "range" (radial distance) of ***locations surrounding a current position to be displayed***. The range may be user selected or automatically adjusted ***based on the number of directory entries retrieved*** for a specific range value. The process then passes to ***step 351, which depicts displaying all directory locations within the specified range***."

> (*See* Almbaugh, col. 10, lines 31-40, *emphasis added*)

v. Claim 15

a. A portable terminal with walking navigation according to claim 1, further comprising: a device for retrieving a route from said present place to said destination

718. Claim 15 depends from Claim 1, and adds the further limitation “a device for retrieving a route from said present place to said destination”.

719. As described above, Almbaugh in combination with Colley renders Claim 1 obvious.

720. Almbaugh describes collecting waypoints as the user travels a route, and then subsequently retracing the route by displaying these stored waypoints in sequence, with lines connecting them. For example:

> Waypoints reflecting an essentially straight line of travel are compressed into end points defining the straight line. The tolerance parameters for determining what comprises a "straight" line are also user selectable values. Whenever the GPS signal is lost for a significant number of collection intervals, a LOS notation is made in the waypoint table. ***Subsequent display of the route taken from the waypoint table may include a straight, dotted line connecting the last waypoint stored before loss of signal and the first waypoint stored after recovery of the signal, optionally with an appropriate notation indicating loss of signal***.
>
> (*See* Almbaugh col. 8, lines 54-63, *emphasis added*)

> If the data derived from the newly collected waypoint indicates "straight" line travel, the process proceeds to step 337, which indicates placing a new straight line end point into the table, replacing the last previous waypoint. The process then returns to

> step 330 for retrieval of a new GPS coordinates reading. ***If the data does not indicate straight line travel within the defined acceptable variation, the process proceeds instead to step 338, which depicts adding a new waypoint to the table.***
>
> (*See* Almbaugh col. 8, lines 10-20, *emphasis added*)

721. Almbaugh also describes that this "itinerary" could be planned (i.e. in advance) as opposed to "preformed"

> Preferably, it includes means enabling local multimedia information to be recorded and played back, together with means ***enabling a planned or a performed itinerary to be recorded and displayed, in particular with its characteristics times, distances, and changes in altitude***.
>
> (*See* Almbaugh col. 2, lines 16-21, *emphasis added*)

722. Almbaugh described, for example that a stored route may be retraced, that is retrieved from storage and displayed so that the user can retrace a previously followed route. For example:

> The general directions navigation option may be employed to retrace a route previously taken and documented by automatic waypoint collection as previously described. ***The destination arrow and directions are simply computed for each waypoint, with the next waypoint being selected as a new destination when a current waypoint is reached.***
>
> (*See* Almbaugh col. 10, lines 8-14, *emphasis added*)

723. A PHOSITA would understand that in order for a sequence of stored waypoints to be retraced, they would first need to be retrieved.

724. Colley describes a device for retrieving a route from a current position (present place) to a destination. In the Colley system, the Navigation System provides (or retrieves) a set of "waypoints". A PHOSITA would understand that, as described by Almbaugh, these waypoints represent the starting point, intermediate destinations between the starting point and the final destination, and that the path connecting these waypoints is commonly known as the "route". The final destination is simply the last waypoint in the set. For example:

> ***Current commercially available electronic chart display implementations typically indicate relevant geographic features, routes and waypoints***, the user's position, and the user's track."
>
> (*See* Colley, col. 1, lines 32-34, *emphasis added*)

725. Colley discloses a navigation system that can be used in a variety of applications, including pedestrian (i.e. "walking") applications, for example hiking.

> While display system embodiments discussed above relate to a user steering a craft, such as a boat or aircraft, it will be recognized that ***embodiments of the invention may be incorporated into almost any type of moving object, system, or simply carried by a person***. Applications for the present invention may vary widely. Any application where latitude, longitude, and course information is available may utilize steering indicator embodiments of the present invention. For example, ***hikers*** or horseback ***riders*** may find it useful to have a guidance tool which can enable them to determine whether they are on a correct course, and what changes to make if they are not.
>
> (*See* Colley, col. 5, lines 31-42, *emphasis added*)

b. wherein said display displays said route and displays a direction of movement by the arrow

726. Almbaugh describes that the route is displayed using arrows linking each waypoint to the next.

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
>
> (*See* Almbaugh col. 9, lines 35-41)

> The general directions navigation option may be employed to retrace a route previously taken and documented by automatic waypoint collection as previously described. ***The destination arrow and directions are simply computed for each waypoint, with the next waypoint being selected as a new destination when a current waypoint is reached.***
>
> (*See* Almbaugh col. 10, lines 8-14, *emphasis added*)

727. Colley also describes that the "display displays said route" (lines 104 and 114 in Figure 1 above), and displays the direction of movement using an arrow (illustrated as item 116 in Figure 1, above). For example:

> For example, FIG. l(a) shows the current implementation in most commercial systems. ***A desired route with dotted waypoints 102 is indicated by the straight lines 104 which comprise the intended track 114***. The destination waypoint is shown as a circled dot 110, and the dotted line 112 indicates the user's actual track.

> (*See* Colley, col. 1, lines 45-50, *emphasis added*)

> The user's position and COG are determined by the navigation system and indicated on the display as a ***directional pointing icon, such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

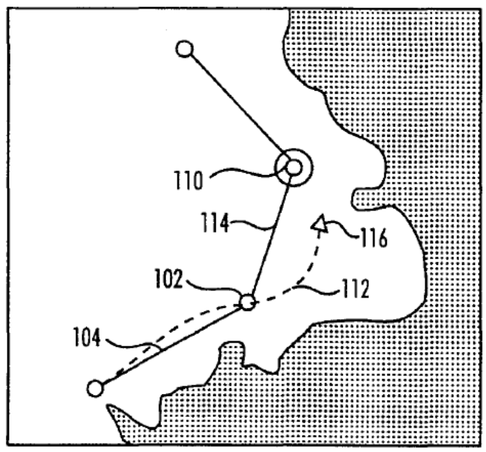

FIG. 1a

728. Colley also describes this limitation in connection with Figure 3 where the legs of the route are described as lines connecting waypoints. For example

> An origin waypoint 310 represents one of the segment waypoints, as shown in FIG. 2. ***The origin waypoint is often described with respect to point-to-point navigation, which allows the user to follow multiple straight-line segments along a route.*** The origin waypoint indicates the beginning of the leg, while the destination waypoint indicates the end of the leg. ***By connecting the points along the route, each origin and destination waypoint describes a leg of the route, which is shown in FIG. 3 as a desired track 312***.
>
> (*See* Colley, col. 4, lines 16-24, *emphasis added*)

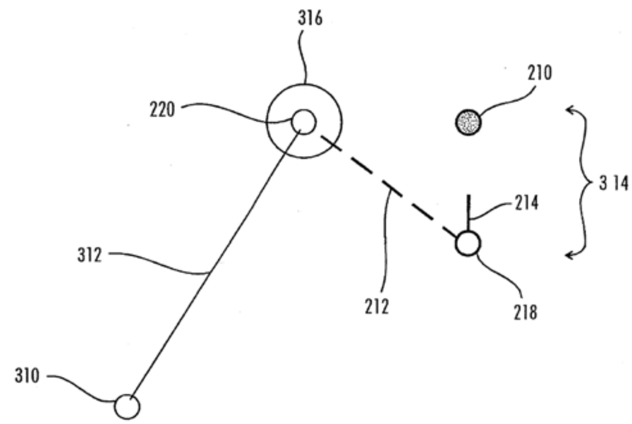

FIG. 3

Colley FIG. 3

vi. Claim 16

a. A portable terminal with walking navigation according to claim 15, wherein said display further displays said grid information of said route."

729. Claim 16 depends from Claim 15, which depends from Claim 1 and adds the further limitation "wherein said display further displays said grid information of said route".

730. As described above, Almbaugh in combination with Colley renders Claim 1 and Claim 15 obvious.

731. As described elsewhere in this report, in my opinion Claim 16 is invalid for indefiniteness and lack of written description. However, to the extent that it is determined that "said grid information" is road grid information, then Almbaugh describes this. For example, Almbaugh describes displaying the directions arrow superimposed on a map within the display.

> The arrow displayed to indicate the direction of a desired location may be superimposed on a digitally encoded map within the display.
> (*See* Almbaugh, col. 9, lines 54-56)

vii. Claim 17

a. A portable terminal with walking navigation according to claim 15, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route.

732. Claim 17 depends from Claim 15, which depends from Claim 1, and adds the further limitation "wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route".

733. As described above, Almbaugh in combination with Colley renders Claim 1 and Claim 15 obvious.

734. Almbaugh describes collecting waypoints as the user travels a route using a technique wherein collected waypoints that lie on a straight line are "compressed by discarding intermediate waypoints and only storing the first and last waypoints on the straight line. For example:

> If a minimum distance has been traveled since the last waypoint was collected, the process proceeds instead to step 336 depicted in FIG. 3G, which illustrates a determination of whether the collected waypoint lies on a straight line with two previous waypoints. This may be determined by computing the azimuth between the newly collected waypoint and the last previous

> waypoint, computing the azimuth between the last two previous waypoints, and comparing the two azimuths. A small range of variation, such as 1 ° or less, may be tolerated in determining that the newly collected waypoint lies in a "straight" line with immediately preceding waypoints.
>
> (See Almbaugh col. 7 line 67 to col. 8, line 7)

> Waypoints reflecting an essentially straight line of travel are compressed into end points defining the straight line. The tolerance parameters for determining what comprises a "straight" line are also user selectable values. Whenever the GPS signal is lost for a significant number of collection intervals, a LOS notation is made in the waypoint table.
>
> (*See* Almbaugh col. 8, lines 54-58)

735. Thus, because waypoints that lie in a straight line are not compressed (that is, the intermediate waypoints are discarded), the waypoint table will *only* contain the locations of waypoints that do *not* fall in a straight line.

> ***If the data does not indicate straight line travel*** within the defined acceptable variation, ***the process proceeds instead to step 338, which depicts adding a new waypoint to the table.***
>
> (*See* Almbaugh col. 8, lines 15-20, *emphasis added*)

736. This is also illustrated in Figure 3G, reproduced below.

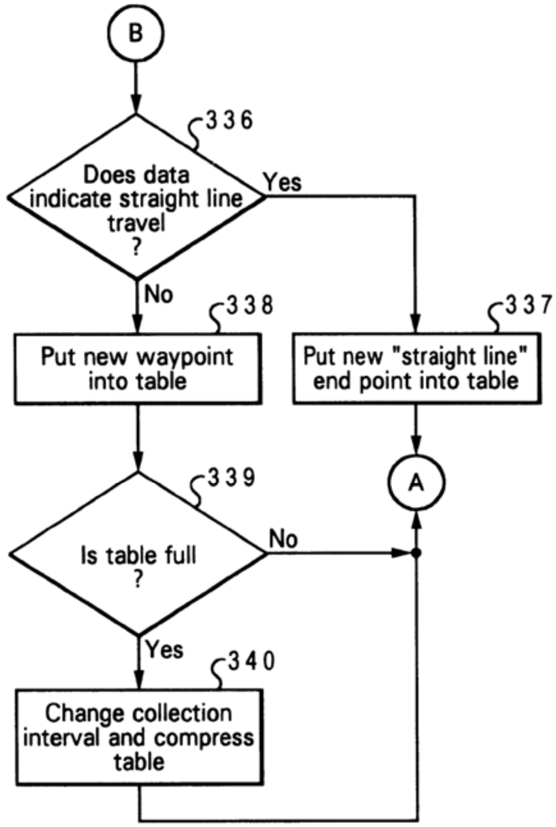

Fig. 3G

737. In addition, Almbaugh describes that if the GPS signal is lost, a loss of signal (LOS) entry is made in the table, and subsequently, when the route is displayed, a dotted line will be used to link the "waypoint stored before loss of signal and the first waypoint stored after recovery of the signal". For example***:***

> Whenever the GPS signal is lost for a significant number of collection intervals, a LOS notation is made in the waypoint table. ***Subsequent display of the route taken from the waypoint table may include a straight, dotted line connecting the last waypoint stored before loss of signal and the first waypoint stored after recovery of the signal, optionally with an appropriate notation indicating loss of signal***.

> (*See* Almbaugh col. 8, lines 54-63, *emphasis added*)

738. And as described in connection with Claim 16, Almbaugh describes displaying a route using lines linking consecutive waypoints retrieved from a waypoint table.

> The general directions navigation option may be employed to retrace a route previously taken and documented by automatic waypoint collection as previously described. The destination arrow and directions are simply computed for each waypoint, with the next waypoint being selected as a new destination when a current waypoint is reached.
>
> (*See* Almbaugh, col. 10, lines 8-14)

> The process passes next to step 343, which depicts calculating the direction for the arrow to point on a display (which may involve simply computing the azimuth to the desired destination), and then to step 344, which illustrates displaying the arrow on a display device, optionally with text indicating the direction and distance to the desired destination.
>
> (See Almbaugh Col. 9, lines 35-41)

739. A PHOSITA would understand that, since the stored waypoints are not on a "straight line", the resulting path between waypoints, the line formed by linking consecutive waypoints will be "bent"

740. Colley describes that the route is represented on the display as a sequence of linked line segments connecting the various waypoints. As can be appreciated in the Figures 1 and 2 below, the resulting line follows the waypoints, and this

defines the route. As the waypoints are not necessarily collinear, the line will be "bent". For example:

> The user's position and COG are determined by the navigation system and indicated on the display as a directional pointing icon, ***such as a line or arrow***.
>
> (*See* Colley, col. 2, lines 18-23, *emphasis added*)

> Thus, preferably the display 200 shows a graphical representation of numerical data combined with instantaneous course correction information. The ***actual track 216*** of the user is designated as a dotted line. The PCA 210 is shown relative to ***the user's current position 218 and the destination waypoint 220***. *A* ***bearing-to-destination (BTD) indicator 212*** connects the destination waypoint to the user's current position showing the direction from the user's position to the destination waypoint."
>
> (*See* Colley, col. 3, lines 39-47, *emphasis added*)

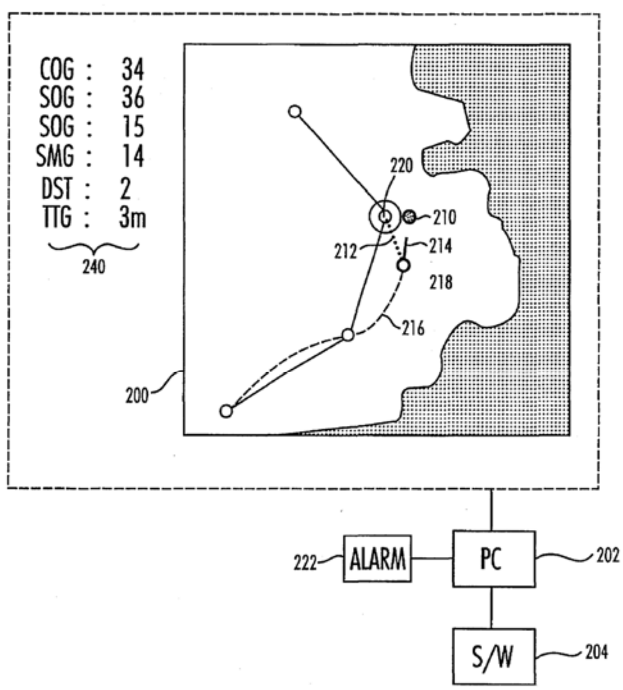

FIG. 2

Colley FIG. 2

> An origin waypoint 310 represents one of the segment waypoints, as shown in FIG. 2. The origin waypoint is often described with respect to point-to-point navigation, which allows the user ***to follow multiple straight-line segments along a route.*** The origin waypoint indicates the beginning of the leg, while the destination waypoint indicates the end of the leg. By connecting the points along the route, each origin and destination waypoint describes a leg of the route, which is shown in FIG. 3 as a desired track 312.
>
> (See Colley, col. 4, lines 16-24, *emphasis added*)

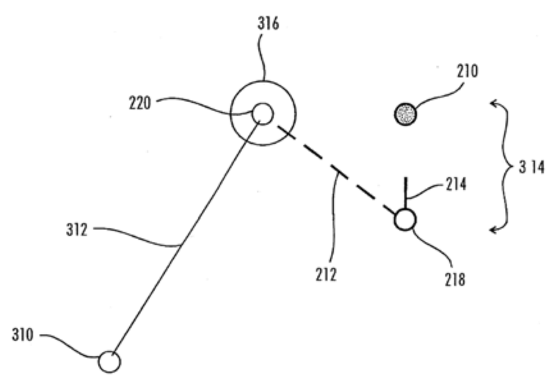

FIG. 3

Colley FIG. 3

741. To the extent that it is determined that Almbaugh does not explicitly describe displaying multiple route segments at the same time, and thus does not explicitly describe displaying the route using a "bent line", a PHOSITA would find it obvious to do so based on the teachings of Colley. Both Almbaugh and Colley describe systems to provide navigational guidance to a user. Almbaugh's focus is on the collection of route information, obtaining route and point of interest information from a remote server, and providing guidance as the user follows that

route. Colley's focus in specifically on the display of such guidance information, and, in particular providing an improved display that is more intuitive and more effective at guiding the user to the destination. A PHOSITA implementing the system of Almbaugh would thus be motivated to use this improved display technique described by Colley, and in doing so would be confident that this simple substitution of one known element for another would yield the predictable result of a more intuitive and easily understood guidance display, in this case displaying multiple segments of the route so that the user would better understand the upcoming maneuvers. In this combination, each of the systems would be performing the same function it had been known to perform (i.e. the waypoint processing functionality of Almbaugh, and the display functionality of Colley) and would yield no more than one would expect from such an arrangement.

viii. Claim 20

a. A portable terminal with walking navigation according to claim 17, wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route.

742. Claim 20 depends from Claim 17, which depends from Claim 15, which depends from Claim 1, and adds the further limitation "wherein said display displays said route with a bent line using symbols denoting starting and ending points and displays symbols denoting said present place on said route".

743. For the same reasons presented above in relation to Claim 17, this claim is also invalid.

XIII. CONCLUSION

1. I declare that the foregoing is true and accurate to the best of my knowledge, and I will testify as such if called to do so.

Respectfully submitted,

Scott Andrews
1/5/2018